Forest Administration Report of the Province of Bombay

For the Year 1938-39

Part I

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Correction Slip to the Forest Administration Report of the Province of Bombay for the year 1938-39, Part I.

1. In the list of illustrations appearing on page iii the description against serial No. 3 should be read against serial No. 5 and *vice versa*.

2. The description under the photograph facing page 12 should be read for the photograph facing page 14 and *vice versa*.

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FOREST ADMINISTRATION REPORT OF THE PROVINCE OF BOMBAY FOR THE YEAR 1938-39.

CHAPTER I.

CONSTITUTION OF STATE FORESTS.

(1) ALTERATIONS IN AREAS (FORM NO. 51, PARTS I AND II).

The total area of reserved and protected forests in charge of the Forest Department remained unchanged i.e. it stood at 10,569 and 160 square miles respectively; while that in charge of the Revenue Department dropped from 1,636 to 1,630 square miles of reserved forest and from 617 to 610 square miles of protected forest.

This does not mean that there were no afforestations and disforestments but that the total area remained unchanged because the one counterbalanced the other. About 12 square miles were disforested mainly in favour of cultivation in the Thana, Poona, Satara, East and West Khandesh, Ahmednagar, Sholapur, Dharwar and Bijapur Districts. In the Kolaba Division a few acres were disforested partly for cultivation and partly for building sites. Besides these, territorial changes occurred in the Central and Northern Circles due to retrenchment. The North Khandesh Division was abolished and its area was divided between the East and West Khandesh Divisions. The Akola and Rajur ranges of the Poona Division of the Central Circle were transferred to the Northern Circle, and the Satara Division was converted into a sub-division without any alteration in area.

FOREST SETTLEMENTS.

The total area of reserved forest pending settlement at the commencement of the year was 3 square miles and 39 acres to which was added 1 square mile and 319 acres. Out of this an area of 2 square miles and 513 acres was finally settled and 4 acres were deleted. In addition 10 acres were finally declared as protected forest. No expenditure was incurred.

A programme for the acquisition of the first class demarcation survey numbers in the Poona Division and the Satara sub-division was sanctioned by Government, Rs. 40,000 being allotted to the Revenue Department for the purpose. But the acquisition work in the Satara sub-division was subsequently suspended and the proceedings in the Poona Division in respect of the area taken in hand were not completed during the year.

DEMARCATION.

Three miles of new boundaries were demarcated artificially at a cost of Rs. 15 in the Southern Circle and 22,089 miles of existing boundaries

(including those between British territory and Goa, Mysore and Bhor) were repaired at a cost of Rs. 4,308. The total length of existing boundaries at the close of the year was 37,105 miles. The determination of the boundary on part of the line separating the British and Baroda territories is still pending. The proposal to recognise the present cleared fire line in Deomogra as the interstate boundary is, however, being pushed forward.

Forest Surveys.

Two square miles of forest land in Dharwar-Bijapur Division were surveyed by the Survey of India Department. No other survey work was done during the year.

The expenditure on the constitution of state forest was Rs. 4,406.

CHAPTER II.

MANAGEMENT OF STATE FORESTS.

(1) Regulation of Management.

(*a*) *Preparation and control of working plans.*

As important as the conservation of forests or even more so is the preparation and periodic revision of working plans for the utilisation of mature tree growth as fully as possible and for its replacement on scientific lines by a healthier and more valuable crop of utilisable species to meet the needs of the local population and the industries of the country.

The activities of the Bombay Forest Department in this respect are briefly summarised below :—

(1) The revised working plan for the Panch Mahals forests received the Chief Conservator's approval and is in the Press.

(2) The working plan for the West Khandesh Division (South Tapti) was also approved by the Chief Conservator. In anticipation of Government sanction effect has been given to Part II of the plan for timber areas, coupe 2 having already been marked according to its prescriptions. A start is also being made with Part III of the plan (Pasture Working Circle) incorporating a rotational grazing scheme.

(3) The working plan for the Thana gurcharans together with the Conservator of Forests, Northern Circle's proposals for the management of the gurcharans was submitted to Government whose orders are awaited.

(4) The scheme drawn up by the Divisional Forest Officer, Working Plans, for the exploitation and fire protection of the Akrani forests requires some modifications in respect of fire protection and sequence of working, which are now being considered by the Conservator.

(5) The special scheme for rotational grazing in the Shirpur East Range mentioned in the last year's report was modified to suit local conditions and is at present being tried out,

(6) The revision of the Gund working plan is nearing completion.

(7) The preliminary report on the revision of the Kalinadi slopes working plan is being written by the Divisional Forest Officer, Working Plans, Southern Circle.

(8) With a view to determining the best method of treatment to be prescribed for the Mundgod teak pole forests, certain proposals of the Divisional Forest Officer, Kanara Eastern Division, are being tried for one year before proceeding with the revision of this plan.

(9) Owing to pressure of other work little progress could be made with the proposed consolidated plan for all teak pole and scrub forests of the Dharwar-Bijapur Division.

(10) *A cent per cent.* enumeration of the sandal-wood areas of the Belgaum Division was undertaken over an area of about 30 square miles as a preliminary to the revision of the sandalwood working plan of the division.

(11) The enumeration of sandalwood trees in the forests of Sirsi-Siddapur Range of the Kanara Eastern Division was continued and a further area of 84·9 square miles was gone over bringing the total area examined up to date to 111·9 square miles.

The following working plans need revision :—

(1) Working plan for the Mandvi forests (Surat District)

and

(2) Working plan for the Bulsar and Chikhli forests (Surat District).

The Conservator proposes to include the Baragaon Dangs (Nasik District) as a separate working circle when the revision of the above 2 plans is undertaken so as to have one consolidated plan for the whole of the Surat Sub-Division. At present the Baragaon Dangs forests are dealt with in the Dangs working plan.

(3) Working plan for the Tulshi forests. This will be taken up on receipt of Government sanction to the inclusion in it of the Municipal forests in the Vehar Catchment area.

(4) The sequence of several coupes of the revised Thana working plan needs rearrangement but the field work involved is considerable and cannot be undertaken for the present owing to lack of establishment.

(5) The Poona and Satara working plans will require modification if rotational grazing is to be introduced since at present no closure is prescribed for the Pasture working circles while the thinnings prescriptions are not satisfactory.

In addition to the normal work connected with working plans, the Divisional Forest Officer, Working Plans, Southern Circle, was engaged for some time on the survey of the available *bamboo* supplies in the Kalinadi valley and also on the enumeration of species suitable for plywood in the Supa Range. The indications are that the progress of working plans work is likely to suffer since the working plans officers will have to devote more and more of their time to collecting statistics as and when proposals for starting various industries are received by Government.

Control.

The prescriptions of all working plans were adhered to in essential details, unavoidable deviations were regularised with the sanction of competent authorities. Usual causes, viz. lack of demand, poor quality of tree growth, inaccessibility or long leads were responsible for several coupes remaining unsold. In the Kolaba Division extensive erosion prevented the casuarina coupe of the year from being worked. Selected trees from coupes 13, 14, 15 and 16 (part) were, however, sold as fishing stakes and these brought in a handsome revenue of Rs. 1,753.

Communications and Buildings.

(*a*) *Roads and Bridges.*

The means of transport as well as the condition of communications play an important part in determining the price of any commodity. With a view, therefore, of obtaining good prices for our timber and other forest produce and making it easy for the purchaser to remove his material, the Department has constructed and maintained roads and cart-tracks aggregating 1,100 miles in length and a railway line of about 19 miles. These communications also help the agriculturists in the remote villages to market their produce. This year 15 miles of cart roads and 7 miles of bridle paths in Khandesh and bridge on the Katur-Bomanalli and a culvert on the Anegundi-Muttoli roads in Kanara were constructed at a cost of Rs. 2,095. 1,077 miles of roads and 36 miles of cart-tracks and bridle paths were repaired at a cost of Rs. 43,820 and Rs. 43,277 were paid to the M. & S. M. Railway for the maintenance and working of the Alnavar-Dandeli forest railway. The corresponding figures of last year's expenditure on new works and repairs and the Alnavar-Dandeli Railway were respectively Rs. 9,306, Rs. 39,140 and Rs. 41,241.

The construction of the Ozar-Saiwan, Tembha-Parali and Washala-Dolkhamb roads and repairs to the Hatgad-Wani road, all in the Northern Circle and already approved by Government, await allotment of funds.

(*b*) *Buildings.*

The total expenditure on the construction of new buildings in all the circles was Rs. 33,698 (Rs. 32,925 last year) and on repairs to existing buildings Rs. 15,790 (Rs. 17,547 in the previous year).

(*c*) *Miscellaneous* (*Other Works*).

The works under this head usually consist of wells and fencing of compounds. The total expenditure on new works and repairs was Rs. 2,595 and Rs. 3,517 respectively as against Rs. 1,226 and Rs. 3,763 of the previous year.

Protection of Forests.

Forest protection in the interest of the country and the enforcement of forest law for the purpose necessarily bring the Department into conflict with individual interests and tend to make it unpopular.

View of Toran Mal in the West Khandesh—Akrani. A new and improved bridle-path was constructed to it from Jaipani this season. It is proposed to extend the motor road ten furlongs beyond Jaipani this year, that is to within 5¼ miles of Toran Mal.

The total number of offences detected during the year was 22,085 as against 21,489 in the last year. The increase shows that in spite of the fact that the subordinates were fully occupied with silvicultural and other important works, the protection of forests received equal attention. The general protection of the forests is still far from satisfactory. It is hoped greater co-operation can be expected from the people in future in this respect due to the grant of liberal concessions in the matter of grazing and the extension of other forest privileges during the last 2 years, as well as to the constant lecturing by Rangers and other forest officials on forests and forest privileges and rules, as part of the propaganda for rural reconstruction.

Injury by Fire and Protection from Fire.

The number of offences under this head rose from 1,559 in the last year to 2,144 during the year under report, the increase occurring in the Northern and Central Circles. The following table compares the results of two fire seasons, 1st June 1937 to 31st May 1938 and 1st June 1938 to 31st May 1939. These figures do not tally with those in form No. 58 which are for the financial year ending 31st March 1939 :—

Circle.	Fire season.	Area attempted to be protected.	Failures.	Area actually protected.	Percentage of area actually protected.	Cost.	Cost per acre.
		Sq. miles.	Sq. miles.	Sq. miles.		Rs.	Rs.
Northern ..	1938-39 ..	2,882	154	2,728	94·6	7,701	2·5
	1937-38 ..	2,677	100	2,577	96·3	6,850	2·5
Central ..	1938-39 ..	3,631	127	3,204	91·1	5,147	1·1
	1937-38 ..	3,837	227	3,610	94·1	7,442	1·9
Southern ..	1938-39 ..	889	23	866	97·4	11,160	12·9
	1937-38 ..	971	27	944	97·2	7,520	8·0
Total ..	1938-39 ..	7,402	604	6,798	91·03	24,008	3·24
	1937-38 ..	7,485	354	7,131	95·2	21,812	3·06

The area burnt during the year is far in excess of the last year and all the circles contributed towards the increase. The causes for the increase are the intentional firing by the Bhils of Dohad and Jhalod ranges in the Panch Mahals and by poachers in the Thana district, prolific growth of grass due to the heavy monsoon of 1938, fires resulting from sparks from railway engines passing through forests and the indifference of the villagers in some cases in rendering help to put out fires. In the Southern Circle the increase in the area burnt was due to the exceptionally hot and prolonged fire season.

The experiments in restocking the grassy areas in the Tansa catchment area by fast growing species were continued during the year.

Turbans of the total value of Rs. 150 were distributed amongst *patils* and *vethias* as rewards for good fire protection in the Surat Sub-Division.

An extension of the system of rewarding villagers who assist the Forest Department in fire protection was sanctioned by Government and Rs. 100 have been provided for each division for the year 1939-40.

About 585 acres of plantations were burnt in Kanara Eastern Division as against 468 acres in the preceding year and the dry areas of Mundgod and Katur ranges suffered much. About 100 acres of plantations at Bhagwati and Hudsa in Kanara Northern Division were burnt in spite of every precaution against fire.

Unauthorised Fellings.

There was on the whole an increase by 120 cases (12,334—12,214) over last year. The Central and Southern circles contributed towards this increase while the Northern Circle showed a decrease of 266 cases. The decrease in the Northern Circle, ascribed to better protection, mainly occurred in the Panch Mahals, East and West Thana divisions and to a lesser extent in East and West Nasik. The recent orders of Government whereby persons carrying headloads of firewood are not to be questioned as regards the source of the wood beyond 5 miles from the limits of the forest are also responsible to a certain extent for the drop.

During the year two boats were hired for detective patrol work, one for eight months in the Bassein creek in West Thana and the other for six months in the Vaitarna creek in North Thana where looting and theft by water were rife in the past. This measure is reported to have operated as an effective check on illicit removal of timber and firewood and so preserved the forests along the creeks from hacking and looting.

The Divisional Forest Officer, North Thana, reports that the protection of forests in the coastal ranges of Palghar and Sanjan has considerably deteriorated. The people in these parts, in order to meet their daily wants for fuel, resort to manufacture of deadwood. The local staff hardly finds time to devote to protection work as they are fully occupied with silvicultural and other important works.

There was an increase of 354 cases in the Central Circle. The Divisional Forest Officer, East Khandesh, reports that the increase in his division was due to illicit removal of fuel from the forests of the Jalgaon Range by the local people, while the Sub-Divisional Forest Officer, Satara, attributes the increase in his charge to greater vigilance on the part of his subordinates.

There was on the whole an increase of 34 cases in the Southern Circle, shared by the Kanara Northern and Eastern and the Dharwar-Bijapur divisions. The increase is attributed to stricter vigilance of the subordinates. Kanara Western Division and Belgaum showed a decrease of 51 cases and the Divisional Forest Officers of those divisions attribute it to a better understanding, as a result of instruction, on the part of the villagers of the value of forests to the community.

"The explanation for the decrease", the Conservator states, "is to some extent correct, but it will be many years yet before any appreciable general decrease in forest offences can be expected."

Unauthorised Grazing and Protection from Cattle.

There was on the whole a decrease of 167 cases (4,960—5,127 = — 167) and all the circles contributed to it. The decrease is attributed to (*a*) the extension of the free grazing privilege to the cattle from non-forest and inam villages, (*b*) the policy of not impounding cattle found without free permits except in the case of a third offence and the concession of opening to grazing all closed coupes older than three years in Bijapur.

The areas open and closed to grazing were as follows:—

	Square miles	Per cent.
Closed to all animals for the whole year	1,358	10·4
Closed to all animals part of the year	249	1·8
Open to all animals except browsers for the whole year ..	8,749	67·5
Open to all animals except browsers for part of the year ..	70	0·5
Open to all animals for whole year	2,541	19·8
Total ..	12,967*	100·0

*This area excludes the area of 2 square miles submerged in the Bhandardara lake.

The area open to grazing for horned cattle throughout the year was 87·6 per cent. The reduction in the period of closure from 10 to 5 years was continued in the three Thana and Panch Mahals divisions except in areas where fires had occurred. As the normal period of closure for all areas under regeneration including teak plantations was reduced to five years as per Government orders a larger area was available for grazing in Kanara. As there was no appreciable improvement in the conditions prevailing in the Bijapur district the concession allowed last year was continued. Grass cutting was permitted in all closed areas and closed coupes older than three years were thrown open for grazing. To remove inconvenience to the villagers of Kamatgi in the Hungund taluka, Bijapur district, coupe XXIII-14 (118 acres) of the Bijapur scrub forest which was to remain closed until the 31st March 1939 was opened in advance to grazing.

The total recorded number of cattle admitted to graze was 19,25,978 as compared with 19,96,950 in the previous year and 22,35,475 the average of the 3 years.

The decrease in the number of cattle occurs in the Northern and Central Circles while the Southern Circle records an increase. The decrease is perhaps only apparent as owing to the introduction of free grazing the obligation to take grazing passes was not realised by owners of cattle; some indeed made it a "grievance" that they had to undergo the trouble of taking out passes; while a large number were suspicious that figures were being collected with a view to reintroducing the fee system.

The Conservator of Forests, Northern Circle, reports that it is noticeable that where *grazing* costs little or nothing cattle are often found in large numbers and very poor in quality; whereas the best plough cattle are found where stall feeding is practised and only small grazing grounds are available for exercise.

The number of cattle impounded during the year was 76,688 as against 78,238 in the last year. The decrease is due to the reasons already mentioned in the first paragraph of this sub-section.

The total grazing fees collected on cattle coming from places outside Bombay Province and Indian States was Rs. 20,540.

Other Offences.

There was a decrease of 68 offences under this head. The majority of cases under this head consists of breaches of transit rules and no reasons can therefore be ascribed for the variation in the number.

Out of 395 cases (222 new and 173 old) taken to court 220 were decided. Of these 198 were in favour of the department and 22 against. One hundred and seventy-five cases are still pending. The percentage of successful cases was 90.

During the year 16,998 cases were disposed of. Of these 16,002 were compounded, the amount of compensation recovered therefor being Rs. 61,787 or Rs. 3·9 per case as against Rs. 4·2 in the previous year. In 996 cases the offenders were let off with a warning and 4160 cases remained undetected.

Protection against Injuries from Natural Causes.

Vegetable pests.

(1) *Creepers and climbers.*—Creepers and climbers were cut as usual by subordinates except in the Northern and Southern circles where it was done through the agency of contractors wherever possible.

(2) *Loranthus.*—Loranthus was kept under control in Kanara Western Division by removing and burning the affected parts of the trees.

(3) The prickly pear which was destroyed by the cochineal insects is reappearing in some parts of Badami and Bagalkot ranges of the Dharwar-Bijapur Division, but so far not on a scale to attract attention. The cochineal insect is now absent and it is possible that prickly pear will gradually reappear and spread again unless kept back by the introduction of fresh broods of the insects.

Animal Pests.

Rats, hare, porcupine, monkeys and *sambhar* are as usual responsible for some damage to the forests of the Northern and Southern Circles.

In addition to these, *nilgai* in the Northern Circle, and elephant, bison, *chectal* and wild pig also in the Southern Circle did some damage. About 10,000 teak plants in the Sunksal one-year-plantation alone were damaged by bison and porcupine. Attempts to kill porcupine in plantations by poisoning with potatoes treated with arsenic were again made in Western Division, Kanara, but without success. Rupees four were paid as reward in the Western Division, Kanara, for killing 4 porcupine.

In the Mandvi Range (Surat Sub-Division) monkeys are reported to have destroyed a new plantation wholesale. All the stump plants which had grown 2′ to 3′ high were broken back leaving stumps barely 6″ to 8″ high.

Insect Pests.

There was a mild attack by teak defoliators in the North Thana Division and, unlike the year 1937-38, the inflorescence was nowhere found to have been killed and hence no difficulty was experienced in teak seed collection.

Dr. C. F. C. Beeson, Forest Entomologist, Dehra Dun, visited the North Thana Division in November 1938 for a preliminary enquiry into the defoliator attack and according to his recommendations an insectary has been opened at Palghar from 1st May 1939 and is being operated by Mr. B. M. Bhatia of the Research Institute with one field assistant and other staff.

In the Surat Sub-Division stump-plants were attacked in some rabs by caterpillars which killed the plants by gnawing the roots. A few plants were attacked from the crown and killed by an unidentified red coloured borer.

Ravlook cricket (*Brachytrypes achatinus*) again did considerable damage in the casuarina plantations of the Karwar Range, Western Division, Kanara. Crickets were also responsible for destroying one month old teak plants in the Ramanguli Range of the same division. Teak leaf defoliation was noticed in some parts of Kanara Northern Division and Dharwar-Bijapur Division but defoliation was not so widespread or serious as in the previous year.

Two logs of *Shorea talura* (*jhall mara*) trees containing larvae of the borer mentioned in the last year's report, were sent, after the close of the year to the Forest Entomologist, Dehra Dun, for further examination. The control measure suggested by the Entomologist could not be put into effect as the forest staff was fully engaged on other important works.

Frost and Erosion.

There was no damage by frost. Small portions of casuarina plantations and of a teak plantation in the Karwar Range in Kanara Western Division were washed away by abnormal floods. The casuarina plantations of Akshi and Nagaon in the Kolaba Division were damaged by erosion though to a smaller extent than in the previous year.

CHAPTER III.

SILVICULTURE.

1. System of Management.

The area in charge of the Forest Department aggregates 10,729 square miles of which 7,616 square miles are organised under various silvicultural systems as detailed below :—

Silvicultural system.	Area in square miles.	Percentage of the total area.
1. Clear fellings	2,749	25·6
2. Selection	265	2·5
3. Uniform	331	3·1
4. Improvement	606	5·7
5. Selection cum-improvement	616	5·7
6. Modified clear fellings and coppice with reserves ..	974	9·1
7. Combination of clear and Improvement fellings ..	400	3·7
8. Improvement cum-clear	12	0·1
9. Simple coppice	518	4·8
10. Other	1,145	10·7
Total under silvicultural systems	7,616	71·0
Protection, grazing and uncontrolled	3,113	29·0
Total ..	10·729	100·0

2. General Progress of Regeneration and Afforestation.

It is one of the primary functions of the Forest Department to regulate exploitation and regenerate the area exploited so as to maintain a continuous supply of timber and fuel. The progress of regeneration and afforestation made during the year was on the whole satisfactory and is summarised below :—

(*a*) *Mainly natural.*

The total area under natural regeneration both concentrated and not concentrated was 55,974 acres as against 58,923 acres in the preceding year.

Tiwas (*Ougeinia Dalbergioides*) rab in coup No. 21. Felling Series XXI, North Thana.
The plantation is one year old and the maximum height 10'.

(i) *Concentrated.*

Planting of teak stumps, sowing of teak and *injaili* (junglewood) species such as *babul* (*Acacia arabica*), *nim* (*Azadirachta indica*), *khair* (*Acacia catechu*), sandal (*Santalum album*), *matti* (*Terminalia tomentosa*), *honne* (*Pterocarpus marsupium*), *kindal* (*Terminalia paniculata*), *jamba* (*Xylia xylocarpa*), *sagadi* (*Schleichera trijuga*), etc., suitable for the locality, were carried out throughout the Province on rab patches in exploited coupes. The results of these operations are promising in all the divisions except East Nasik, part of Belgaum and Dharwar-Bijapur divisions.

The technique of raising plantations on rabs in Thana by pure groups (the species chosen being suitable for each individual locality) is quite sound and is now well understood. It tends to uniform growth and thinnings are more easy to execute than in plantations where there is an intimate mixture either by single trees or single lines. As regards teak rabs a natural ground-cover of *injaili* always creeps in, but where the rabs are very big and continuous, orders have been issued to split them up by planting at least 3 consecutive rows of suitable *injaili* (e.g. *bio—Pterocarpus marsupium* and *tiwas—Ougeinia dalbergioides*, etc.) after every 12 rows of teak.

In addition to the planting of stumps and sowing of seed of various species, plantations were also raised by the agricum-forestry or agri-silvicultural system wherever possible throughout the Province and especially in the East Nasik Division. There were in this division in all 663 plot holders at the close of the year as against 497 in the previous year and an additional area of 816 acres was brought under this form of cultivation. When the work under this system was first started in this division, the chief species sown were *babul* (*Acacia arabica*) and *anjan* (*Hardwickia binata*) but the former is apt to die off when there is a subsoil pan, and the latter is heavily browsed. A good mixture of species, e.g., *anjan* (*Hardwickia binata*), *khair* (*Acacia catechu*), *babul* (*Acacia arabica*) *nim* (*Azadirachta indica*) etc., is therefore now being tried so that there will be greater chances of a comparatively full stocking reaching maturity in these arid tracts.

(ii) *Not-concentrated.*

The results of sowing up open areas with a variety of species, according to the soil factors of the locality selected were disappointing throughout the Province.

(*b*) *Mainly artificial.*

Natural regeneration was supplemented by artificial regeneration wherever necessary.

In North Thana an area was wirefenced and seedlings of casuarina (*Casuarina equestifolia*) raised in the nurseries were transplanted. Out of 1,500 seedlings planted, 750 are reported to have survived at the end

of the year. Planting of casuarina has been revived after a lapse of a number of years and it is hoped that the local staff will soon gain experience with this species.

In the Central Circle 235 acres in East Khandesh and Poona *babul* (*Acacia arabica*) was successfully raised from seed.

The following table gives the areas regenerated with teak (*Tectona grandis*) on an intensive scale in the Kanara Northern, Eastern and Western divisions :—

Working Plan.	Area planted acres.	Spacing.	Cost.
			Rs.
1. Bhagwati High Forest working plan.	76	6′ × 6′ ....35 acres 12′ × 6′ .... 1 acre. 9′ × 9′ ....40 acres.	2,437
2. Supa High Forest working plan.	136	9′ × 9′	4,554
3. Gund Working Plan ..	76	6′ × 6′ ....26 acres 9′ × 9′ ....50 acres	1,904
4. Nagzari working plan ..	40	9′ × 9′	774
5. Revised working plan for the Yellapur-Mundgod teak high forests.	380	9′ × 9′ and 6′ × 6′ ..	10,156
6. Ramanguli-Ankola high forest working plan.	150	6′ × 6′ on lower slopes and 12′ × 6′ on steep ground.	1,482
Total ..	858	Total ..	21,307

About 100 acres of the older plantations in Kanara Northern Division were burnt by accidental fires. The damaged plants were cut back and are progressing satisfactorily.

93 acres in Kanara Western Division, 18 acres in Belgaum and 4 acres in Dharwar-Bijapur divisions were artificially regenerated with casuarina (*Casuarina equestifolia*) teak and *babul* (*Acacia arabica*) respectively.

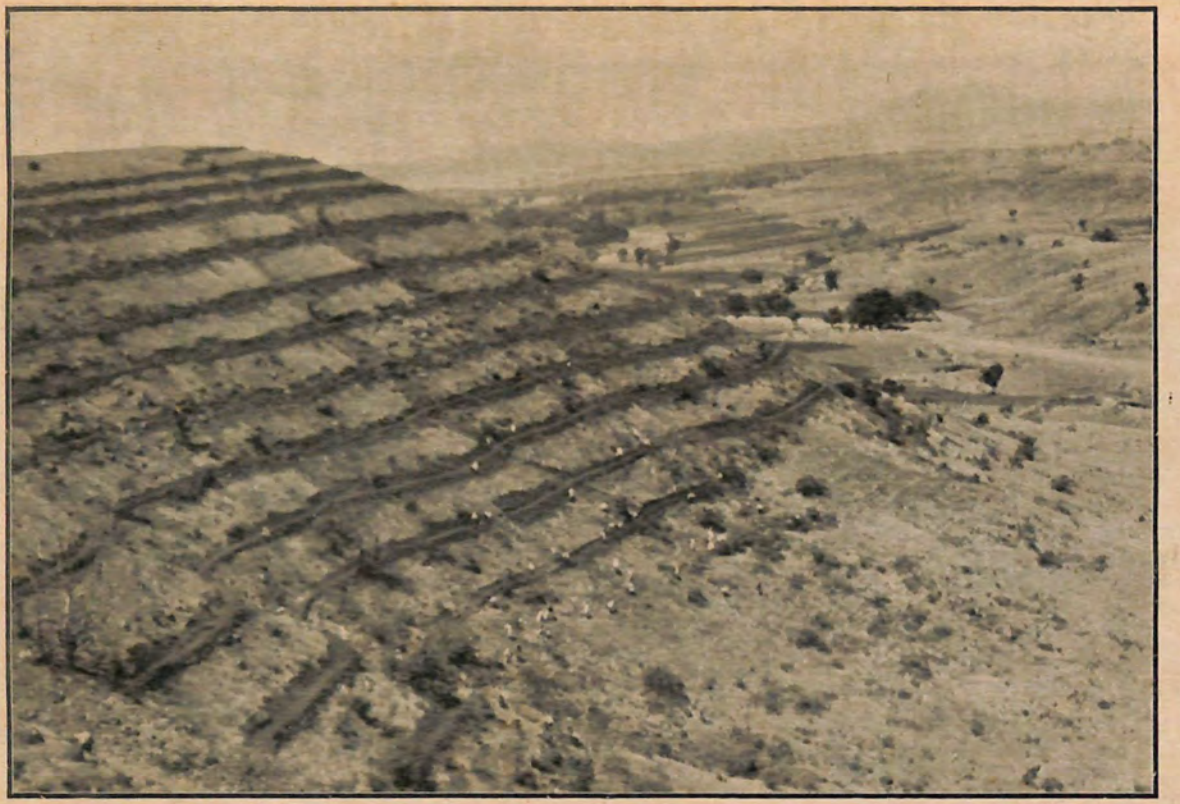
The general condition of plantations in the Southern Circle is satisfactory.

(c) *Afforestation.*

Rs. 4,000 have been placed at the disposal of this Department for afforestation of arid areas during 1939–40.

100 acres (30 acres in West Khandesh, 30 acres in East Nasik, 30 acres in Poona and 10 acres in Satara) were taken in hand and the experiment is being carried out on the lines of the Italian " Gradoni system ".

Contour trenching near Khed, Poona division. The hill side is badly eroded and consists of boulders and murum. The trenches cost Rs. 3-8-0 per 100 running feet to dig and build up.



Contour trenching near Khed, Poona division. The average horizontal spacing is 24′ except near the top.

Along with the works of contour trenching and agri-cum-forestry attempts are also being made to create a sense of arboriculture among the people. Forest Officers of all grades encourage villagers to take up tree-growing. In the Bijapur district seedlings of *nim* (*Azadirachta indica*), *tugli* (*Albizzia amara*), sandal (*Santalum album*), *sirsul* (*Albizzia lebbek*), *tamarind* (*Tamarindus indica*), *kashid* (*Cassia siamia*) were raised in nurseries during the year by Forest guards without any cost to Government and they were offered to the villagers in June and July last for planting in their holdings. Similar work was also taken up in the Dharwar district. The Chief Conservator issued orders to raise seedlings of cashewnut (*Anacardium occidentale*) and casuarina (*Casuarina equestifolia*) in nurseries in each of the 4 coastal ranges of Western Division, Kanara, for supply to the people who wish to plant them in their holdings.

At the suggestion of the Director of Agriculture, the Collectors of districts have been asked by Government to prepare schemes for planting trees in Government waste lands, along the banks of *nalas* and tanks, along roadsides, in public places and also in private lands in their districts. It is proposed under this scheme to establish nurseries at various centres and in the Public Works Department bungalow compounds and similar suitable sites and to give the seedlings free to people and associations who wish to plant them. Some of the schemes submitted by the Collectors are at present under the consideration of Government, and the Chief Conservator of Forests and the Director of Agriculture have been requested to advise generally on these schemes.

Encouragement is also being given to private persons to plant fruit trees in open forest lands at their own expense and for their own use under certain conditions. These orders of Government have been widely notified and a little more time is required before material results can be expected.

Tending of Growing Stock.

In addition to the work of regenerating exploited forest areas by natural and artificial methods, the tending of plantations devolves on the forest subordinates. No purpose is served by raising plantations unless they are looked after and cared for until they are finally established. Mulching, weeding, clearing and other silvicultural operations were carried out when due.

Thinnings were either sold standing or done departmentally the cost of departmental working was Rs. 19,296 and the total revenue realised was Rs. 2,07,418. In a few instances where the villagers did the work, they were allowed at their own request to take away the material in return for their labour.

Last year all the older plantations in the Southern Circle were examined and work was started to improve their condition by timely thinnings of suitable intensity. This work was continued during this year. The Conservator personally thinned a number of plots in different localities to demonstrate to the assembled staff various methods of executing thinnings in crops of different ages and evolved a rough and ready method to determine the correct intensity of thinnings for each age class. There is still a general tendency to thin too lightly. It will take time to remedy this everywhere but much improvement is already evident, and with continued effort and repeated instruction there will, in the course of a few years, be a very marked improvement in the state of all teak plantations of this circle.

Now that the appointment of a Silviculturist for this Province has been sanctioned by Government, silvicultural problems will receive his undivided attention.

CHAPTER IV.

EXPLOITATION AND UTILISATION.

The economic laws of supply and demand are applicable to the marketing of forest produce as well as to any other produce. To maintain the equilibrium between exploitation and utilisation and to avoid abnormal fluctuations in the timber market, exploitation of timber and fuel is regulated by fixing a definite sequence of coupes in all working plans. This sequence is based not only on the age the stand will attain but also on the quantity and kind of the material which will be put on the market as a result of exploitation to meet the estimated normal demand of the people at that time.

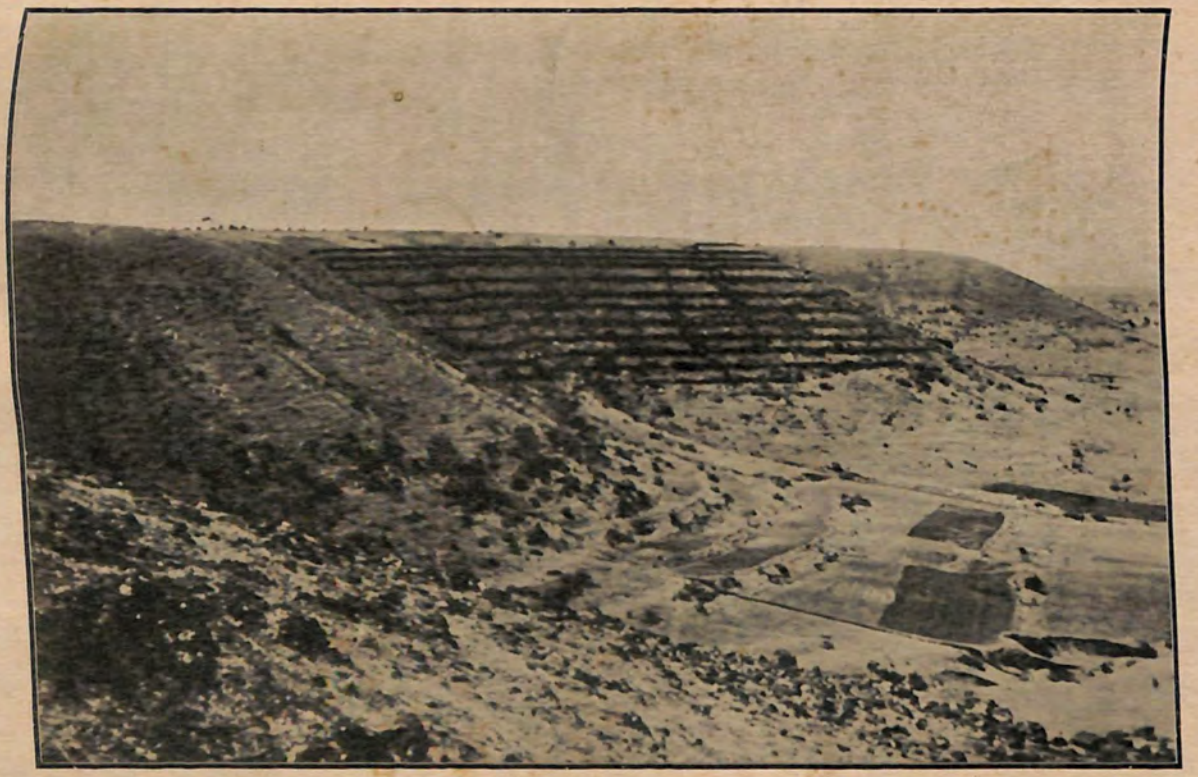
(*a*) SYSTEMS OF MANAGEMENT.

The various systems of exploitation and the area worked thereunder are given in Chapter III under the caption " System of Management ".

(1) MAJOR FOREST PRODUCE.

Timber, Fuel and Sandalwood.

Timber and fuel were extracted in the Northern Circle solely through the agency of purchasers, while in the Central Circle the same agency was employed except that fuel for the Government depots at Mahableshwar and Panchgani was extracted departmentally. In the Southern Circle some material either for sale as logs or for conversion into sawn material was extracted departmentally or through contractors from most of the High Forest areas, while waste wood left *in situ* and the standing crop in some of the High Forest compartments and Pole and Fuel coupes were sold to purchasers. Sandalwood was extracted departmentally and brought to the Government depots for conversion and sale. Essentially silvicultural operations such as early thinnings were carried out departmentally in most cases.



Contour trenching at Nagaon Bari near Dhulia, West Khandesh. Work completed on the further side of the valley. It is proposed to make the flatter bottom of the valley fit for agriculture by means of bunds. The distant trees are along the Bombay-Agra road.

Contour trenching at Nagaon Bari near Dhulia, West Khandesh The average horizontal spacing is 17′ but is as close as 9′ or 10′ near the top of both hill sides shown. The cost is about Rs. 1-8-0 per 100 running feet.

(ii) *Minor Forest Produce.*

Minor forest produce was as usual either farmed out or sold on permits in all the circles. *Hirda* (*Terminalia chebula*) fruit was collected, as hitherto, in the Rajur Range on the "quota" or share system. As the "quota" previously fixed, viz. 71 *khandis*, 8 maunds and 5 *payalis* was reduced by Government by 25 per cent. the total quantity collected amounted to 53 *khandis*, 11 maunds and 3¾ *payalis* and it was sold by tender at Re. 1 per bag of 20 *payalis*, the revenue realised from this source being Rs. 643 as against the rate of Rs. 1-12-5 per bag and the total realisation of Rs. 1,522-3-0 of the previous year. No expenditure was incurred other than Rs. 22-4-0, the cost of advertising the sale. The decrease in revenue is due to poor demand. Grass and grazing fetched Rs. 1,67,769 against Rs. 4,69,411 last year. Grazing fees having been abolished, this revenue now represents the sale proceeds of grass from closed areas and kurans surplus to grazing requirements, and grazing fees on outside cattle.

(a) Agency of Exploitation.

(1) *Departmental agency.*

The following is a comparative statement of major and minor forest produce extracted departmentally during the two years 1938-39 and 1937-38 :—

Circle.	Year.	Major Forest Produce.			
		Timber C.ft. in thousands.	Fuel C.ft. in thousands.	Total C.ft. in thousands.	Sandal-wood value.
					Rs.
Northern	1938-39 ..	86	420	506	4
	1937-38 ..	142	500	642	..
Central	1938-39 ..	165	387	552	115
	1937-38 ..	91	457	548	330
Southern	1938-39 ..	669	1	670	96.866*
	1937-38 ..	550	13	563	1,20,816
Total ..	1938-39 ..	920	808	1,728	96,985
	1937-38 ..	783	970	1,753	1,21,146
Difference ..	....	137	—162	—25	—24,161
Percentage of total out-turn from all sources ..	....	11·6	10·1	21·7	100

*Value of sandalwood extracted but not sold during the year.

Circle.	Year.	Minor Forest Produce.			
		Bamboos value.	Grass and grazing value.	Other produce value.	Total value.
		Rs.	Rs.	Rs.	Rs.
Northern	1938-39 ..	15	..	..	15
	1937-38 ..	18	..	..	18
Central	1938-39 ..	..	..	..	..
	1937-38 ..	..	..	1,647	1,647
Southern	1938-39 ..	54	..	86	140
	1937-38 ..	15	..	23	38
Total ..	1938-39 ..	69	..	86	155
	1937-38 ..	33	..	1,670	1,703
Difference ..	....	36	..	—1,584	—1,548
Percentage of total outturn from all sources ..	....	..	..	..	..

The timber outturn in the Central and Southern Circles shows an increase and more than counterbalances the deficit in the Northern Circle. The increase is attributed to the clearing of tree growth for construction of new roads in the West Khandesh Division, to the better progress made by the logging contractors in Kanara Northern Division and the heavier thinnings carried out in a large number of coupes throughout Southern Circle. Less material obtained from departmental thinnings was responsible for the deficit in the Northern Circle.

The general decrease under fuel was due to less material from the thinnings in the Panch Mahals, and East and North Thana Divisions and also in the Southern Circle.

The appreciable increase in the value of sandalwood in 1937-38 was, as stated last year, due to some disagreement between the chief sandalwood merchants and to the method of retail sale in which they competed against one another. The merchants have since settled their differences and the result has been that practically none of the 1938-39 sandalwood was sold by retail while bids at the annual auction sales were exceedingly low. The sales were therefore postponed and the material was subsequently sold in April 1939 for Rs. 96,866.

The period, viz. 15th February to 15th March, during which the sales in the Bombay Province are to be held was fixed in the Sandalwood Conference of January 1937. This time of the year is found unsuitable because it entails the enforcing of stringent conditions for payment of the purchase price before the end of the financial year. The contractors offer abnormally low bids in the hope that the Department will accept their bids to realise the amounts within the financial year and consequently poor prices for Bombay sandalwood is the result. A proposal to hold the Bombay sandalwood sales in future in April each year has been agreed to by the Inspector General of Forests, who was the Chairman of the Sandalwood Conference, and by the other Provinces party to the conference.

The value of the minor forest produce extracted departmentally varies according to the quantities removed for departmental purposes or for supply to other Government departments.

Timber Depots.

The average prices obtained for timber in the Dandeli depot where the major part of the timber extracted departmentally is sold are given below and compared with the prices realised in 1937–38. This comparison will however show that the prices obtained in 1938–39 are in some cases slightly lower than those of the previous year. On the whole the prices obtained were satisfactory.

Kind of timber.	Average rate per *khandi* of 12·50 c.ft.	
	1938–39	1937–38.
	Rs. a. p.	Rs. a. p.
Teak (*Tectona grandis*)	25 11 5	25 15 0
Matti (*Terminalia tomentosa*)	9 15 9	11 4 7
Nana (*Lagerstroemia microcarpa*)	10 5 2	10 2 10
Honne (*Pterocarpus marsupium*)	13 15 7	13 10 0
Karimuttal (*Ougeinia dalbergioides*)	17 6 11	16 1 2
Sissum (*Dalbergia latifolia*)	10 5 8	11 6 9
Heddi (*Adina cordifolia*)..	10 15 2	11 5 1
Other junglewoods	9 6 0	10 1 10
Teak battens	17 0 0	18 0 4
Teak scantlings	21 6 0	23 1 6
Teak planks	36 4 0	40 10 8

The price obtained for teak at the Kodibag depot was Rs. 23-15-2 per *khandi* against Rs. 21-4-7 last year.

The six fuel depots in Kanara Western Division and the Mahableshwar and Panchgani depots in the Satara Sub-Division were worked through contractors. The only departmentally worked depot was at Matheran, where 6,132 maunds of fuel were sold for Rs. 3,447, the expenditure excluding establishment charges being Rs. 504. The net surplus of Rs. 2,943 after deducting the cost of permanent establishment was paid to the Matheran Municipality.

(ii) *Purchasers.*

The following table compares the outturn of major and minor forest produce removed by consumers and purchasers during the years 1938–39 and 1937–38 :—

Circle.	Year.	Major Forest Produce.			
		Timber.		Fuel.	
		C.ft. in thousands.	Value	C.ft. in thousands.	Value
			Rs.		Rs.
Northern	1938–39 ..	2,858	13,95,264	8,321	23,929
	1937–38 ..	2,730	14,06,873	8,290	21,521
Central	1938–39 ..	2,267	3,56,297	5,612	59,448
	1937–38 ..	875	3,37,256	5,393	65,958
Southern	1938–39 ..	1,486	5,46,673	5,295	1,77,503
	1937–38 ..	1,747	5,14,036	5,711	1,86,832
Total ..	1938–39 ..	6,611	22,98,234	19,228	2,60,880
	1937–38 ..	5,352	22,58,165	19,394	2,74,311

Circle.	Year.	Minor Forest Produce.			
		Bamboos value.	Grass and grazing value.	Other value.	Total value.
		Rs.	Rs.	Rs.	Rs.
Northern	1938-39 ..	18,523	51,179	30,717	1,00,419
	1937-38 ..	18,741	1,26,328	30,773	1,75,842
Central	1938-39 ..	10,918	1,15,265	34,899	1,61,082
	1937-38 ..	13,664	3,02,523	40,866	3,57,053
Southern	1938-39 ..	64,167	804	26,908	91,879
	1937-38 ..	65,922	863	36,939	1,03,724
Total ..	1938-39 ..	93,608	1,67,248	92,524	3,53,380
	1937-38 ..	98,327	4,29,714	1,08,578	6,36,619

The Northern and Central Circles show an increase in the quantity of timber and fuel collected while the Southern Circle shows a decrease under both. The increase under timber in the Northern Circle is attributed to the better stocking in the coupes sold in the North and East Thana Divisions whereas in the Central Circle the sale of more coupes in East Khandesh and Satara accounts for the increase in volume under timber and fuel. The increase under fuel in the Northern Circle is due to the sale of trees in woodland plots in North Thana and the transfer of Akola and Rajur Ranges to the Northern Circle from the Central Circle.

The decreases under timber and fuel in the Southern Circle are due to the fact that several coupes and compartments sold standing in Kanara Eastern and Western Divisions and Dharwar-Bijapur Division were not completely worked by the purchasers.

Comparing the prices realised with the quantity sold it may be said that the prices obtained for timber and fuel in the Southern Circle are higher than those in the Northern and Central Circles. The reason for the lower prices obtained in these circles is the general depression in the timber market and the increased use of charcoal as fuel.

The decrease in the revenue realised from minor forest produce is accounted for by the poor stocking of *bamboo* in the compartments opened for exploitation in North Thana, abolition of grazing fees, poor prices for kurans, reduction in the rate of *anjan* (*Hardwickia binata*) leaves, non-recovery of royalty for *mhowra* (*Bassia latifolia*) flowers from the Excise Department, decrease in the number of outside cattle grazing in Bombay forests, withholding of the sale of the *shikekai* (*Acacia concinna*) farm in the Belgaum Division and Supa Range and poorer demand for some of the minor forest produce farms.

(iii) *Rights, Privileges and Free grants.*

The following is a comparative statement of the quantity and value of forest produce removed by right and privilege holders and free grantees during the years 1938–39 and 1937–38 :—

Circle.	Agency.	Major Forest Produce.				Minor Forest Produce.			
		Timber.		Fuel.		Bamboos value.	Grass and grazing value.	Other value.	Total value.
		C. ft. in thousands.	Value.	C. ft. in thousands.	Value.				
			Rs.		Rs.	Rs.	Rs.	Rs.	Rs.
Northern ..	C ..	..	..	11,022	2,21,183	75,591	9,68,608	1,22,727	11,66,926
	F ..	18	9,849	1	10	261	..	694	955
Central ..	C ..	..	..	6,317	1,44,786	..	7,08,502	1,12,282	8,20,784
	F ..	25	9,007	1	45	103	..	6,519	6,622
Southern ..	C ..	324	24,237	8,308	1,03,096	4,619	3,88,601	44,291	4,37,511
	F ..	55	16,331	1	26	944	..	8,145	9,089
Total ..	C ..	324	24,237	25,647	4,69,065	80,210	20,65,711	2,79,300	24,25,221
	F ..	98	35,187	3	81	1,308	..	15,358	16,666
Total for 1937–38	C ..	59	12,602	26,309	5,18,033	75,354	16,01,125	3,76,525	20,53,004
	F ..	75	19,981	4	160	684	55	49,737	50,476

C=Concessionists. F=Free grantees.

The quantities of timber removed by concessionists and free grantees are far in excess of the last year's figures. Similarly the total money value of the minor forest produce removed by concessonists also exceed that of the previous year. The abnormal increase under grass and grazing is due to the abolition of grazing fees.

The only recognised rights are those of way. Villagers enjoyed as usual the various privileges allowed under settlements, local rules and

other Government orders. The quantity of forest produce removed varies according to the requirements of the privilege holders.

The additional privileges granted to the people during the year are summarised below, the orders in the first two cases have been issued after the close of the year :—

(1) Forest privileges admissible to forest villages were extended to a number of specified adjoining non-forest villages in the Province.

(2) The privilege of free removal of thorns on permits from open forest for agricultural and domestic use only has been granted to all forest villages except in the Poona and Satara districts, and to certain non-forest villages in several districts of the Province.

(3) The forest villagers in the Thana district have been granted the privilege of removing toddy palm, (*Caryota urens*) leaves from open forest for their domestic use, and the villagers of Panch Mahals the privilege of removing *apta* or *asotri* (*Bauhinia racemosa*) leaves both for domestic use and sale or barter.

(4) Forest villagers in all talukas of the Nasik district except Dindori are allowed to remove and sell mhowra (*Bassia latifolia*) fruit from reserved forest.

(5) The concession of removing on payment of half an anna per headload, for sale or barter, deadwood other than teak, *khair* (*Acacia catechu*) and *tiwas* (*Ouginia dalbergioides*) granted to Bhils and other aboriginal tribes, who are permanent residents of forest villages in parts of Khandesh, has been extended to all such people in the East and West Khandesh districts.

(6) Privilege holders in Kanara have been permitted to take posts except those of reserved species for the erection of permanent wire fences.

(7) The privilege of removing during June, July and August the bark of *matti* (*Terminalia tomentosa*) from special reserves and minor forests adjacent to their villages was granted to the fishermen and *chamars* (shoemakers) of Kanara Western Division. A maximum limit of 1,000 standard maunds in the case of fishermen and 125 in the case of *chamars* has been fixed at the concessional rate of two annas per maund.

As a result of the deliberations in the conference of revenue and forest officials and the leading pubic workers in Kanara held at Supa under the chairmanship of the Honourable Revenue Minister in May 1938, the following privileges have been sanctioned for the Kanara district :—

(8) A gun licence holder, who is a *bona fide* resident of Kanara will be granted a free licence to hunt and shoot in reserved forest, with a view to abatement of wild animal pest.

Any such licensee resident in those areas of reserved forest which have been organised under the block system will be entitled to shoot only in such forest as lies within a radius of 3 miles from his village and where the block system has not been applied, will be entitled to shoot in any reserved forest in the taluka which is not included in a shooting block.

(9) With a view to providing larger elbowroom round inhabited and cultivated areas in the interests of public health and the preservation of crops, clearance of forest and undergrowth round habitations and cultivations has been permitted under certain conditions, in all above-ghat talukas and certain villages of below ghat talukas where the forest growth is thick.

(10) Orders have been issued for increasing the assignment of *bettas* (forests set apart for the exercise of privileges by garden holders), the scale to be worked up to being 9 acres of *betta* to 1 acre of garden—Beehives in *bettas* are to be considered to belong to the *betta* holders. All privileges of *bettas* will be extended to *hadi* lands (auxiliary lands for the exercise of privileges by the holders of garden and rice lands in below ghat talukas).

(11) Firing of a strip one mile wide around habitation will be allowed in all forest areas once every three years under the supervision of the Forest Department. *Kumri* (shifting) cultivation will be allowed in the strip area for the first two years after clearance. Thereafter the villagers will be permitted to undertake any type of cultivation they desire.

(12) The concession of 1 *tali* (*Corypha umbraculifera*) palm per adult and ⅓rd of a palm for every child under 12 free of charge in Honavar, Bhatkal and a part of Kumta has been extended to all poor people in those talukas of all castes subject to certain limits.

(13) Bare areas of minor forests may be fired by the villagers every year in April and May to promote the better growth of grass.

(14) Cane and all kinds of grass will be allowed free for all villagers, for domestic use and cottage industries but not for direct sale or barter.

(15) The privilege of collecting honey from trees on strip lands has been granted subject to taking a permit from the Mamlatdar.

Free grants of timber and other forest produce were given in all deserving cases for the construction of houses destroyed by fire, and the construction of and repairs to temples, churches, schools and other works of public utility. Cases which may be specially mentioned are those in which 14 houses in the Karwar Range and 6 in the Bhatkal Range were destroyed by fire in February and March 1939, about 200 houses and cattle sheds in Susgadi village in the Bhatkal Range were washed away by floods during October 1938 and about 80 families were rendered homeless. In all these cases suitable free grants of timber and *bamboos*, etc., were granted.

A free grant of timber to the value of Rs. 1,000 was sanctioned by Government to the *Lamani* Training Class, Bagalkot, for the purpose of preparing spinning wheels for distribution to the *Lamanis* (aboriginal tribe) and for use in the class.

The model timber house exhibited at the Poona Industrial Exhibition of 1937 and worth over Rs. 1,000 was granted free to the Lord Reay Industrial Museum, Poona, as a permanent exhibit.

(c) Outturn and sources of Forest Produce.

The outturn from all sources of forest produce during the two years 1938-39 and 1937-38 compares as follows :—

Circle.	Year.	Major Forest Produce.			Minor Forest Produce.		
		Timber cft. in thousands.	Fuel cft. in thousands.	Sandal-wood value.	Bamboos value.	Grass and grazing value.	Other value.
				Rs.	Rs.	Rs.	Rs.
Northern ..	1938-39 ..	2,962	19,704	4	94,390	10,19,787	1,54,138
	1937-38 ..	2,882	16,557	..	90,430	11,93,844	1,58,457
Central ..	1938-39 ..	2,457	12,317	115	11,021	8,23,767	1,53,699
	1937-38 ..	983	15,141	330	13,824	4,76,192	2,85,097
Southern ..	1938-39 ..	2,534	13,605	96,866	69,784	3,89,405	79,430
	1937-38 ..	2,404	14,979	1,20,816	70,144	3,60,858	92,956
Total ..	1938-39 ..	7,953	45,626	96,985	1,75,195	22,32,959	3,87,267,
	1937-38 ..	6,269	46,677	1,21,146	1,74,398	20,30,894	5,36,510
Difference ..		1,684	—991	—24,161	797	2,02,065	—1,49,243

Forest Labour and Wages.

The exploitation of forests either departmentally or through the agency of contractors provides employment for a large number of people.

The following is an estimate of the labour employed and remuneration paid on forest work during the year :—

Circle.	Agency of employment.	Number of labour units.	Aggregate amount earned.
			Rs.
Northern	Departmental ..	2,84,020	62,937
	Contractors ..	50,66,105	16,46,793
Central	Departmental ..	60,954	24,845
	Contractors ..	11,07,867	3,79,293
Southern	Departmental ..	2,84,028	1,49,854
	Contractors ..	14,75,687	7,43,460
Total ..	Departmental ..	6,29,002	2,37,636
	Contractors ..	76,49,659	27,69,546

Labour rates for departmental works have been brought up to the current market rates wherever they were found to be inadequate. Minimum wage rates have also been laid down for payment to labourers by contractors and orders for the introduction of the prescribed rates in the Thana and Kolaba Districts to start with were issued after the close of the year.

Utilisation.

Forest Industries.

The conversion of forest trees into timber, charcoal and firewood and putting of the same on the market, is a major forest industry giving employment to thousands of labourers as shown in the last paragraph. The Department also supplies information to enquirers about any raw material available in the forests for industries, its quantity, approximate cost of exploitation and the manner of exploitation, etc., or, when possible, undertakes to supply the raw products.

There are at present the following main subsidiary industries to which the department supplies raw materials at concession rates :—

(1) *Match manufacture.*—Match factories started in the beginning in this Province were supplied with wood free or at concessional rates. This industry has now passed the stage at which such concessions are required. In order to make suitable match woods

available in sufficient quantities special fellings of mango (*Mangifera indica*) and *sawar* (*Bombax malabaricum*) for supply to match factories are permitted in Thana and Kolaba Divisions and these species are planted within easy reach of railway lines. During the year only 20 cartloads of match woods were sold for Rs. 73-12-0 in the Mandvi Range of the Surat Sub-Division, while the matchwood coupes in the Panch Mahals and Thana Divisions remained unsold.

(2) *Destructive distillation of wood.*—The forest of this Province can supply an unlimited quantity of suitable material for this industry. A private firm—The Bharat Wood Distillation Factory—has been granted certain concessions. Four coupes were given to this company this year, but extension had to be sanctioned for their working and most of the material was sold in the form of firewood in the open market, very little being used for distillation. The erection of buildings is in progress and some parts of the plant are being made on the premises. Though progress is slow, the company is confident of success.

(3) *Charcoal manufacture.*—This is a flourishing industry in Thana and Kolaba and parts of Poona and Satara Districts. A small batch of men from Kanara who had no regular employment was trained at Government expense in the technique of charcoal making at Astoli in the Belgaum Division. These men are to take up this trade permanently and instruct others who are willing to do so.

Since it is found that better quality and a larger quantity of charcoal can be obtained by the use of the "frikiln" (charcoal kiln devised by the Forest Research Institute) one such kiln was purchased during the year and another was locally manufactured. Demonstrations of charcoal making by this method are at present being given by the Forest Engineer and other Forest officers in the Southern Circle. It is hoped that this industry will thrive in Kanara also.

(4) *Glass bangle industry.*—In order to revive and assist the glass bangle industry at Ghodgeri in the Belgaum District a fuel coupe was ordered by Government to be granted to the Kajgar Co-operative Association Limited, at a concessional rate of Rs. 5 per acre. The advisability or otherwise of continuing the concession will depend upon the report of the Registrar of Co-operative Societies on the progress made by the Association.

(5) *Basket making industry.*—To assist the basket, etc., making industry, *bamboos* at a concession rate of Rs. 3 per 100 instead of Rs. 3-8-0 have been ordered to be supplied to such *medars* (basket makers) of the Belgaum and Dharwar Districts as are members of co-operative societies, provided the bamboos are not sold to outsiders. A proposal for the extension of the concession to other districts is under investigation.

(6) *Catechu manufacture.*—With a view to assisting the revival and development of the catechu trade in the coastal tracts of Kanara a free grant of 300 *khair* (*Acacia catechu*) trees was given to

Mr. S. K. Kallapur of Honavar who is to control the operations. For good reasons Mr. Kallapur was unable to proceed with his scheme during the year.

(7) *Sandalwood carving.*—*Gudigars* of Kanara—a community of expert sandalwood carvers—are granted sandalwood for their industry at a concession rate, which was 50 per cent. of the market rate and has now been further reduced to 25 per cent.

(8) *Tali palm seed for the manufacture of buttons.*—To encourage the sale of *tali* palm (*Corypha umbraculifera*) seed for the manufacture of buttons, etc., the royalty for this seed was reduced from Re. 1 to annas 8 per maund 80 lbs. The Industrial School recently opened at Honavar by Mr. Kallapur, B.A., LL.B., has taken up the manufacture of these buttons and will be supplied with its requirements at a reasonable rate.

(9) The *rosha* (*Cymbopogan martinii*) grass contractors in the Northern Circle who had to pay for dead fallen firewood collected by them from forest for heating the stills are now permitted to collect and use it free of charge.

(10) A free grant of 60 cubic feet of timber was granted for the carpentry class at Sanjan, and the material left lying in coupes Nos. 21 and 22 was granted free for the carpentry class in the Technical School opened by the Village Uplift Organizer at Murbad in the West Thana Division.

During the years 1938 and 1939 Government did their best to encourage the subsidiary industries and considered the possibilities of starting new industries—chief of which are :—

(1) *Paper pulp.*—As the species of *bamboo* obtainable in Kanara has been found suitable for paper pulp and the quantity sufficient for a factory, Government have decided not to carry out further survey and experiments in this connection.

Two projects for the utilization of *bamboos* (*Dendrocalamus strictus*) from the Kalinadi and Gangawali Valleys for the manufacture of paper pulp, etc., were submitted to Government by two different companies, viz. "The Kanara Paper Mills" and "The Karnatak Rayon and Pulp Factory". Certain concessions as detailed on pages 15 and 16 of the Public Information Series for May 1939 have been promised by Government to the companies.

(2) *Plywood industry.*—The possibilities of starting a plywood factory are being examined. The services of Dr. Bor from Dehra Dun were utilised in April last to investigate the possibilities of a sustained supply for plywood manufacture from the evergreen forests of the Gersoppa Valley including the Malemane and Devimane ghat. Various specimens of timber have been sent to Dehra

Dun for tests and report on their suitability for the manufacture of plywood.

(3) *Charcoal gas.*—The possibility of developing the use of producer gas from charcoal mainly for traction units is being examined. The Forest Engineer is engaged on experimenting with a local charcoal burning Fordson tractor. The results of these tests are reported to be promising. Government have sanctioned the purchase of one producer gas lorry.

(4) *Sterculia gum.*—Experimental tapping on the Central Provinces lines has been ordered to be carried out in West Nasik, North Thana and Surat (Mandvi).

Investigations to find out suitable substitutes for foreign woods used in special industries were carried out in connection with the following:—

(1) *Picking arms.*—Twenty-two sticks for picking arms prepared in the Kanara Eastern Division from *nandi* (*Lagerstroemia laceolata*), *dindal* (*Anogeissus latifolia*), and *dhamani* (*Grewia tiliaefolia*) were supplied to the Forest Engineer for distribution to 3 different mills for further tests to gauge the suitability of these species for use as picking arms. Some of these sticks were split from sapwood and some from heartwood, some were seasoned and some unseasoned.

(2) *Shuttles.*—A log each of *Dalbergia latifolia* (*sisu*), *Randia dumetorum* (*pandri*) and *Randia uliginosa* (*ghela*) was sent to the Forest Research Institute, Debra Dun, for testing the suitability of these species for shuttles. The results of the tests are awaited.

(3) *Bobbins.*—Two samples of each of *nana* (*Lagerstroemia lanceolata*), *dhamani* (*Grewia tiliaefolia*) and *shiwan* (*Gmelina arborea*) were supplied to Messrs. Duncan Stratton and Co., Bombay, for preliminary tests for bobbins. The results are awaited.

(4) *Reeling machines.*—Two samples of *Lagerstroemia lanceolata* (*nandi*), and one of *Adina cordifolia* (*heddi*) were sent to the Managing Trustees and Correspondent, P. S. G. & Sons, Charity Industrial Institute, Coimbatore, for tests whether these species would serve as good substitutes for pinewood.

Investigations to find out suitable substitutes for imported wood used for slate frames, shoe heels and lasts and umbrella handles are also being made.

Similarly information about oil seeds for lighting purposes and distillation of oil from leaves of cinnamon trees (*Cinnamomum zeylancium*) is being collected. A brief survey of the present supplies of vegetable tanning materials has been completed.

CHAPTER IV-A.

FOREST ENGINEERING BRANCH.

The Forest Engineering Branch is entrusted with the survey of forest roads, preparation of plans and estimates for roads, buildings and other works, organization of the mechanical side of timber extraction and sawmilling, purchase of stores for sawmills, and development of utilisation methods including experiments in connection therewith. The work done during the year is brifly described below :—

1. Surveys.

Nil.

2. Designs and Drawing Works.

Plans and estimates for a number of buildings and roads in all the circles were prepared and/or checked by the Forest Engineer in addition to the general supervision of the Engineering works in progress. In response to a call from Government, the Forest Engineer prepared four cheap designs for primary school buildings for villages without a heavy rainfall. One of these designs estimated to cost Rs. 479 was selected, shortly after the close of the year, as the most suitable out of several designs of school houses before Government.

3. Mechanical Skidding.

Timber was extracted from Series XI-A compartment 6/22 with the Fordson log skidder from 28th November 1938 to 30th April 1939. The total outturn was 936·68 tons against 1,086·25 tons of the previous year. This was the total quantity allotted for extraction during the season. The extraction costs exclusive of overhead charges amounted to Rs. 6-3-9 per ton with an average length of haul of 1,272 feet. The work carried out by the Fordson tractor and skidder in the Nagzari Valley is extremely strenuous on account of rock outcrops and very steep slopes. The best of the tractors the Department had broke down and a new tractor had to be purchased in March 1939.

Log skidding is one of the most important activities of the Forest Engineering Division, requiring close supervision by a trained and efficient man. The late Mr. Narvekar, Ranger, was in charge of this work which he carried out very successfully since 1930—without any breakdown or accident. This was due to his strict supervision and his able management. His demise on 9th October 1938 is a great loss to the department.

4. Sawmill.

The following table compares the output of the Government sawmill at Dandeli for two years :—

Description of outturn.	1938-39.	1937-38.
	Cubic feet.	Cubic feet.
Teak M. G. sleepers	66,867	69,972
Teak sawn material	92,073	83,470
Junglewood material	237	33
Total ..	159,177	153,475

The increase in the total output is due to the working of an additional 36″ circular saw bench throughout the year. The sawing of sleepers was slowed down in favour of other sawn wood as there was a surplus of sleepers to cover the contract with the M. & S. M. Railway and as in addition to the necessity for meeting the annual demand for other sawn wood, there were extra demands for special sizes from the M. & S. M. Railway.

The results of the working of the Dandeli mill are given below :—

Items.	1938-39.	1937-38.	Difference.
	Rs.	Rs.	Rs.
Revenue	3,73,102	2,67,220	1,05,882
Expenditure	1,37,229	1,30,050	7,179
Net profit	2,35,873	1,37,170	98,703
Capital at charge	77,993	1,11,401	— 33,408
Percentage of net profit on capital ..	302	123	

The net profit shows an increase of Rs. 98,703 due to the fresh contract with the M. & S. M. Railway but mainly to the demand from the railway for special sizes of sawn material.

The Fowler mill and machinery from the old Mandurli mill site were removed and installed at Dandeli as a reserve sawing unit. It is ready for working and is available in support in case of a breakdown in the mill or to meet special demands which the old mill could not take on in addition.

Deadstock and stores.—The deadstock of the mill was checked with the register. Unserviceable articles were either written off under proper authority or repaired. The total value of deadstock and stores supplied to the mill is as follows :—

	Rs.
(1) Deadstock	
(2) Consumable stores	7,187

Sawmill trading account.—The trading accounts of the Dandeli sawmill were audited by the Outside Audit Branch of the Accountant General's office.

Private sawmills working in Kanara forests.—Mr. Sayad Nasroddin Hassansab's mill at Katur in Kanara East Division turned out 5,506 cft. of sawn material against 800 M.G. sleepers and 14,360 cft. of sawn material in the previous year.

A private mill at Vincholi in Kanara Northern Division belonging to Mrs. Jankibai Sawant produced 6,976 M.G. sleepers and 10,044 cft. of sawn material. The raw material was supplied under contract by this department from a departmental work in the vicinity of the mill and the converted wood was delivered at the Dandeli depôt.

5. Utilisation.

This has already been described in Chapter IV under "Industries".

CHAPTER V.

FINANCIAL RESULTS.

The revenue and expenditure of the year compared with those of the last year and the average of the previous quinquennium 1933-34 to 1937-38 as follows :—

Circle.	Year.	Revenue.	Expenditure.			Surplus or deficit.	Percentage of surplus to gross revenue.
			Conservancy and works.	Establishment.	Total.		
		Rs.	Rs.	Rs.	Rs.	Rs.	
Northern ..	1938-39 ..	16,23,095	1,35,011	6,18,734	7,53,745	8,69,350	53·6
	1937-38 ..	16,64,934	1,38,080	6,15,436	7,53,516	9,11,418	54·7
	Average ..	17,39,498	1,44,715	5,84,189	7,28,904	10,10,594	58·1
Central ..	1938-39 ..	6,90,523	76,402	5,69,292	6,45,694	44,829	6·3
	1937-38 ..	7,85,322	90,327	6,23,971	7,14,298	71,024	9·0
	Average ..	10,42,837	95,473	6,08,429	7,03,902	3,38,935	32·5
Southern ..	1938-39 ..	17,25,430	4,09,402	5,93,795	10,03,287	7,22,143	41·9
	1937-38 ..	18,49,871	4,11,317	5,91,924	10,03,241	8,46,630	45·8
	Average ..	20,03,964	5,83,872	5,67,633	11,51,505	8,52,459	42·5
General Direction.	1938-39 ..	12,909	33,534	1,96,864	2,30,398	—2,17,489	....
	1937-38 ..	12,912	33,083	1,87,942	2,21,024	—2,08,112	....
	Average ..	5,143	83,719	97,013	1,80,732	—1,75,589	....
Forest Engineering.	1938-39 ..	8,249	20,585	33,427	54,012	— 45,763	....
	1937-38 ..	2,000	10,751	23,587	34,338	— 32,338	....
	Average ..	3,097	12,018	37,404	50,322	— 47,225	....
Total ..	1938-39 ..	40,60,206	6,75,024	20,12,112	26,87,136	13,73,070	33·6
	1937-38 ..	43,15,039	6,83,558	20,42,860	27,26,418	15,88,621	36·8
	Average ..	47,94,539	9,20,607	18,94,668	28,15,365	19,79,174	45·8
Difference between 1938-39 and 1937-38.		—2,54,833	—8,534	—30,748	—39,282	—2,15,551	

The foregoing statement enables a comparison to be made between the figures of the year and those of the previous year and also the average of the preceding five years.

Comparing the figures of the year with those of the previous year it will be noted that revenue has decreased by 2·5 lakhs of rupees and the surplus by 2·1 *lakhs* of rupees to 13·73. The decrease in revenue was chiefly due to the general depression in the timber market which affected the coupe prices and postponement of sandalwood sales to 1939-40 owing to low offers received. The revenue figure for 1937-38 includes an amount of Rs. 79,317 on account of sandalwood of 1936-37 most of which was sold in 1937-38. On the other hand the revenue figures for 1938-39 excludes an amount of about Rs. 96,866 on account of the 1938-39 sandalwood. As offers were poor, practically the whole of 1938-39 sandalwood was withheld from the annual sales of February and March and subsequently disposed of in April 1939 after the close of the year.

The expenditure under "Conservancy and Works" and "Establishments" also show a decrease of 0·08 and 0·3 *lakhs* of rupees respectively. The former was due to less amount of bonus paid to the District Local Board and land-holders in Thana in consequence of smaller realizations from malki teak sales and to economy in carrying out works. The reason for decrease under "Establishments" is mainly the abolition of the post of Gurcharan officer and of two divisions, viz., North Khandesh and Working Plans, N. C., conversion of the Satara Division into a sub-division and deputation of Mr. E. A. Garland, Deputy Conservator, as Personal Assistant to the President, Forest Research Institute, Dehra Dun.

The analysis of receipts and expenditure show that of the receipts 82·7 per cent. came from major produce, 8·7 per cent. from minor produce and 8·6 per cent. from miscellaneous sources, while of the expenditure 25 per cent. was incurred on extension, constitution, improvement and exploitation and 75 per cent. on administrative, executive and protective charges.

The outstandings on account of revenue at the commencement and close of the year were :—

	On 1st April 1938.	On 31st March 1939.
	Rs.	Rs.
Northern Circle	47,152	47,729
Central Circle	8,707	16,815
Southern Circle	1,73,669	2,00,639
Total ..	2,29,528	2,65,183

The outstandings on account of contractors and disbursers were :—

	On 1st April 1938.	On 31st March 1939.
	Rs.	Rs.
Northern Circle	....	104
Central Circle	11	14
Southern Circle	4,140	2,138
Total ..	4,151	2,256

CHAPTER VI.

RESEARCH AND EXPERIMENT.

Closely related to the regeneration of forests and tending of plantations is research, the results of which serve to eliminate errors in management and to guide future work. In the absence of a Silviculturist and a Research Officer for this Province research work continued to be under the control of the office of the Chief Conservator, the work itself being carried out by the Divisional staff with some assistance from the Working Plans divisions.

The post of a Silviculturist has now been sanctioned for this Province but will not come into being till about September 1939 after which greater progress under this head may be expected. Considerable time must however elapse, as is usual with this kind of work, before the beneficial results of research are visible in the improvement of the quality and stocking of our forests.

The work done during the year is very briefly summarised below together with the results of experiments in subjects of local interest carried out by the Divisional Forest Officers under the control of their respective Conservators :—

(1) NATURAL REGENERATION.

The three plots, referred to in the last year's report, laid out at Bhimashankar for studying the effect on regeneration of (1) removal of undergrowth only and (2) removal of undergrowth and opening of the canopy, were maintained and the results are being watched.

Coppice growth.

Experiments to discover whether there is any difference in coppice growth from trees cut flush with ground and those cut at 6" to 9" above ground level, were carried out in the Northern and Southern Circles. Hardly any difference was noticed.

(ii) ARTIFICIAL REGENERATION.

Hirda (Terminalia chebula).

Subject No. 37.—Sowing and planting of hirda on laterite soil in the shade of existing shrubs or small trees (Poona and Satara).

In one of the two new plots selected last year in the Budhele catchment area in the Poona Division, 3 seeds in each pit were dibbled on 22nd May 1938 in 100 pits and in the other 100 one year old stumps (one in each pit) were transplanted. The seeds were reported to have been destroyed by squirrels, so one seed in each pit was again dibbled on 16th June 1938. The survivals to end of January 1939 were 55 seedlings and 61 transplants respectively. This experiment will be repeated in 1939-40.

Out of the 21 surviving seedlings of the last year in the Mahableshwar Range only 10 are now alive.

In the same range 100 stumps were planted in the last rains in the Bhekavali forests near Lingmala. Out of the 95 sprouts, 59 only are surviving.

In 2 rabs in which *hirda* was sown last season after cracking the fruit without injuring the seed but creating an entrance for moisture, it was observed that germination was about 80 per cent. and the plants in February were about 15" high and vigorous.

Tung (Aleurites fordii).

The dibbling of Tung seeds in Block VI—coupe 2 of the Teak Pole area and in Block VIII-13 (9) of the Bhagwati High Forests proved a failure.

A Tung experimental nursery was started on 30th January 1937 in specially prepared beds at Bomanhalli. Out of 396 seeds dibbled on 30th January 1937 only 114 germinated at intervals up to September 1937. Of these 114 plants, 63 were transplanted close by and watered regularly, the remaining 51 being left in the original nursery beds. The survivals on 31st March 1939 are 82 (60 transplants and 22 seedlings in the nursery). The best plant is 101" high. Watering was discontinued in May 1938. The plants are in a fairly good condition.

Chlorophora excelsa (Uganda).

A quarter pound of *Chlorophora excelsa* seed received from the Silviculturist, Dehra Dun, in August 1937, was tried in East Thana, East and West Nasik, North, West and East Khandesh and Kanara Northern and Eastern Divisions, but was not successful except in Kanara Northern Division.

Mahogany swietenia.

The seed of *Mahogany swietenia* obtained from the Royal Botanic Gardens, Calcutta, was dibbled 9′ × 9′ in well drained soil in a portion of the Maingini coupe, Karwar Range. The plants now average 3′–6″ in height and are being watched.

(iv) TENDING, THINNINGS AND CLEANINGS.

Teak (*Tectona grandis*).

Subject No. 4.—Effect of thinnings on teak coppice at different ages—East Thana Division.

In the East Thana Division eight plots ranging from 8 to 15 years of age are under observation, the object being to discover the effect of thinning on teak coppice at different ages and the relative value of retaining one, two and three stems on each stool.

Measurements of girth are to be recorded every two years and of height every 10 years.

Three girth measurements have been taken up to date showing the following increments put on by one, two and three stems left on a stool :—

	1st and 2nd measurement.	3rd measurement.
	Per cent.	Per cent.
1 stem	23·61	5·17
2 stems	18·64	4·08
3 stems	17·25	3·77

Height measurements in these plots are to be taken in 1940 and 1941.

Subject No. 16.—Effect of improvement fellings on diameter growth.

The next measurements are due in December 1939. This year two more sample plots Nos. 30 and 31 were laid out in the East Khandesh Division according to the statistical code for checking the results of the selection system to be enforced for working the teak forests of the Satpudas.

(v) Miscellaneous.

Subject No. 7.—Annual girth increment of sandal (Belgaum and Dharwar-Bijapur Divisions).

Six plots as shown below are kept under observation in the Belgaum and Dharwar-Bijapur Divisions, for studying the annual girth increment of sandal :—

Division.	Plot Nos.	Area.
Belgaum	7AI to 7AIV	.. 2 acres each.
Dharwar-Bijapur ..	7BI and 7BII	.. 2 acres each.

During the year remeasurements in plots 7BI and 7BII were taken in November 1938 and the average girth increment for these plots is given in the following table :—

	1929.	1932.	1935.	1938.	Total.	Average.
7BI ..	·36″	·24″	·12″	·11″	·83″	·20″
7BII ..	·38″	·23″	·20″	·13″	·93″	·23″
				Average for plot B ..		·21″

Remeasurements in plots 7AI to 7AIV were taken in 1937 and the results have already been given in the last year's report.

In the last two remeasurements the trees were classified into girth classes and the average annual girth increment for each class arrived at is given below :—

Girth class.	Average annual increment.
9″–11″	·09″
12″–14″	·14″
15″–17″	·13″
18″–20″	·14″
21″–23″	·18″

The decided falling off of increment in the lowest girth class is attributed to the lack of cultural operations and orders have therefore been issued that the plots should be given the same silvicultural treatment as is given to other sandal trees in the locality and that the trees which have been marked for measurement should be freed from all hindrances to enable them to put on normal growth.

Subject No. 39.—The correlation existing between the outer girth increment and heartwood increment of sandal (Dharwar-Bijapur).

The object of this investigation is to determine the correlation between the outer girth increment and heartwood increment of sandal. For this purpose 50 trees at Tadas and 36 trees in Honkon were marked and measured in 1930 and 1931 respectively. Two measurements and borings in Tadas plots and one in Honkon plot have so far been recorded but the data collected so far do not indicate convincingly that any correlation between the outer girth increment and heartwood increment of sandal actually exists.

Sheep grazing.

Plots Nos. 28 and 29.—Bhamburda, Poona Division (South Indian Dry mixed deciduous forests).

Each plot is 1 acre in extent. The plots were formed in September 1936 to study the effect of sheep grazing in open forests of this type. After enumerating the tree species of these two plots the area was handed over to the Agricultural Department for their sheep breeding experiments. The area is subjected to controlled grazing. The following observations were made in September 1938 :—

(1) The quality of the grazing shows a distinct improvement compared to the adjacent uncontrolled areas.

(2) In spite of sheep grazing profuse regeneration of *khair* (*Acacia catechu*), *nim* (*Azadirachta indica*), *salai* (*Boswellia serrata*) was possible in the areas under control.

(3) The contour bunding by means of loosely heaped stones on slightly sloping ground had acted beneficially in accumulating silt.

Experiments ordered to be carried out by the Conservators and those that were carried out by the Divisional Forest Officers.

(1) *Jāmba* (*Xylia xylocarpa*) was tried in a rab in a felled coupe of Igatpuri (Northern Circle). The results are encouraging enough to warrant the experiment being tried on a larger scale both in Igatpuri and the Tansa catchment area, since this species besides being evergreen and firehardy, reproduces itself both by coppice as well as by root suckers.

(2) Sandal (*Santalum album*), mango (*Mangifera indica*) and *jambul* (*Eugenia jambolana*) tried near Khambala in the Igatpuri Range have given very encouraging results. It is proposed to extend the experiment.

(3) Attempts to introduce *Cedrela serrata* (*lal deodar*) are being made in the Satara Sub-Division. The seed was sown in a nursery bed and 120 good seedlings were ready. Out of these one-third will be removed and transplanted in another bed (1½ feet apart to give sufficient growing space) and one-third will be transplanted in the forest to see how they fare and the remaining one-third will be kept *in situ*.

(4) *Sawar* (*Bombax maabaricum*), *shiwan* (*Gmeina arborea*) and mango (*Mangifera indica*) were tried in different localities in the Khanapur Range of the Belgaum Division. Of these species *sawar* and mango are promising.

(5) An experiment to season *jamba* (*Xylia xylocarpa*) wood to prevent cracking and splitting was undertaken in the Kanara Northern Division. Fifty trees were felled in March 1938 and left *in situ*. They were cut into sleeper pieces in November 1938. The ends were plastered with mud. Multiple cracks at both ends appeared. The pieces were carted to Dandeli Mill in December 1938 and converted into 131 sleepers in the same month. Only 17 of these were passed, the others being rejected. The different stages of the experiment were not carried out at the proper seasons and the experiment is to be repeated from September 1939 and a fresh lot of 200 sleepers is to be prepared for examination.

(6) In the last year's Administration Report, it was stated that two distinct varieties of teak had been observed in the Hudsa 1924–25 plantation. Specimens of the two varieties were sent to the Forest Research Institute, Dehra Dun, for examination. No botanical distinction between the two varieties was found. During the year the two apparent varieties were also noticed in other localities, the strange variety being locally knows as "*teli*" (oily) teak and considered by the local people to be stronger than the common variety. There is however no botanical distinction.

(7) In order to test the objections to the system of clear fellings with artificial regeneration in Working Circle II of the Working Plan for the High Forests of Northern Division, Kanara, an area of 20 acres in compartment V-1 Dandeli Range was clear-felled during the year for artificial regeneration in the coming year.

Effective fire protection is considered almost impossible in this Working Plan area and it is chiefly to see what measure of success can be expected with reasonable precautionary measures that this experiment has been undertaken. The existing prescriptions for Working Circle II are not satisfactory and require revision and this test was started with a view to the possible introduction of the clear-felling

system. Other objections to the clear-felling system in Working Circle II are deficiency of labour and shortage of funds. It will probably be found that the clear-felling system is not the solution for the problem and that some other system will have to be adopted to increase the productivity of the forests of this Working Circle.

(8) The three test plots laid out to ascertain the reasons for poor girth increment of sandal in the Belgaum Division were treated as follows :—

In plot No. 1 all junglewood trees interfering with crown development of sandalwood trees were cut level with the ground. In plot 2 only the branches of such trees were lopped and climbers cut, while in plot No. 3 no cultural work except the cutting of climbers was done. The results are being watched.

(9) The condition of the experimental sandalwood plantations raised in 1934 to 1936 at Nagargali is quite good. Seed of *Cassia siamea* (*kashid*), *Pongamia glabra* (*karanj*) and *Zizypus xylopyrus* (*ghatbor*) was dibbled where host plants were deficient. *Pongamia glabra* alone was successful. A portion of the 1934 plantation was thinned to remove congestion ; some of the *Cassia siamea* in a part of the 1935 plantation where it was too dense was removed. The freeing of the crowns of the sandalwood plants was done wherever necessary.

The heights and girths in these plantations are :—

Year of plantation.	Height.	Girth.
1934–35	11′–0″	5½″
1935–36	10′–0″	4½″
1936–37	7′–3″	3¼″

CHAPTER VII.

ADMINISTRATION.

The post of the Chief Conservator was held by Mr. D. B. Sothers from 1st April 1938 to 17th November 1938 and by Mr. A. C. Hiley, C.I.E., from 18th November 1938 to the close of the year.

The territorial circles were held by the following officers :—

Northern Circle .. Mr. H. P. W. Davis from 1st April 1938 to 30th September 1938.

Mr. H. W. Starte from 1st October 1938 to 31st March 1939.

Central Circle	..	Mr. J. B. T. Brooks from 1st April 1938 to 1st December 1938.
		Mr. R. P. Dalley from 2nd December 1938 to 31st March 1939.
Southern Circle	..	Mr. W. C. de C. Walsh, throughout the year.

As a measure of retrenchment, Government ordered the following redistribution of charges and reduction of posts during the year :—

(1) the three Khandesh divisions were redistributed into two, the North Khandesh Division being abolished and its area divided between the East and West Khandesh divisions ;

(2) the Satara division was added to Poona as a sub-division, but owing to certain administrative difficulties was subsequently converted into an independent sub-division ;

(3) the Working Plans division of the Northern Circle was amalgamated with the Working Plans division of the Central Circle, the combined division being styled Working Plans Division, Northern and Central Circles ;

(4) the post of Gurcharan Officer, Thana was abolished ;

(5) four sub-divisional posts have also to be abolished as vacancies occur.

In view of this heavy retrenchment, no promotions between, or to, the gazetted ranks were possible, all vacancies of the year having remained unfilled for eventual reduction.

According to the exigencies of administration, the usual transfers of officers took place but towards the close of the year, a shortage of officers was felt. In the Southern Circle the Working Plans Officer was given charge of the Belgaum Division in addition to his own duties while Sub-Divisional Forest Officers had to be put in charge of divisions.

The long felt need of a Silviculturist and a Utilisation Officer was removed by the sanction conveyed, after the close of the year, to the creation of these posts. Messrs. J. Walker and J. V. Karamchandani have been selected to fill these posts respectively and will take up their duties after a short training at the Dehra Dun Research Institute.

Mr. E. A. Garland's services were placed at the disposal of the Government of India and he is at present Personal Assistant to the Inspector General of Forests.

The title of C.I.E. was conferred on Mr. A. C. Hiley, Chief Conservator of Forests, in the New Year's Day Honours.

Two candidates Messrs. R. D. Joshi and N. S. Kaikini were selected for the Superior Forest Service Course of 1938–40 and they are at present undergoing training at the Indian Forest College, Dehra Dun.

Subordinate and clerical service.

The last but one batch of 5 Bombay Ranger students sent to the Madras Forest College, Coimbatore, for training in the 1936–38 course passed the examination with Higher Standard Certificate. Of these two were posted to the Northern Circle, two to the Central Circle and one to the Southern Circle.

There was no selection of candidates for the Rangers' Course during the year under report.

Rangers' Training Class.

Owing to the decision finally to close down in 1939 the Madras Forest College at Coimbatore, arrangements had to be made for the training of six students selected for the 1938–40 course and Government decided to open a Rangers' Training Class at the College of Agriculture, Poona. Mr. R. R. Chaudhari of the Bombay Forest Service was appointed Forestry Instructor in charge of the class to teach the Forestry subjects comprising Silviculture, Forest Management, Forest Engineering, Utilisation and Range Administration and Forest Law, while professors from the existing staff of the Agricultural College coach the students in the remaining subjects of Botany, Physical science, Drawing and Surveying and First aid. This arrangement is not more expensive to Government than either the Coimbatore or Dehra Dun training, while to the students themselves it is decidedly more economical and convenient.

The arrangements are however still tentative. Out of the eight students that are at present receiving training in this class, six are for the Bombay Forest Department, one is from the Janjira State and one from the Sawantwadi State. Government have sanctioned the continuance of this experiment for another two years and have given orders to select six candidates for the Department for the 1940–42 course.

Training of Foresters.

The Foresters' Class at Mandvi in the Northern Circle was, as usual, conducted by a Ranger. Out of 27 students admitted (10 from the Northern Circle, 10 from the Central Circle, 1 from the Dangs and 6 from Indian States) 4 were sent back because they could not follow the course. Out of the remaining 23 students 21 passed the final examination. During the year arrangements were also made to impart simple instruction in drill to the students. The District Superintendent of Police, Thana, was kind enough to send for this purpose a Drill Instructor from Bassein to Mandvi once a week and this Department had only to pay the Drill Instructor's travelling expenses which came to Rs. 24 for the term. The annual course of training foresters and guards in the Southern Circle was continued, as hitherto, under selected Rangers and of the 13 subordinates who attended the course 11 passed

out successfully, one failed and one was re-tested in practical work in February 1939 and considered to have passed.

The work of the Rangers and subordinate protective and clerical staff is reported to be satisfactory. With the advent of a popular Government and the impetus given to many schemes of development, there has been a flush of applications from the people. Detailed enquiries into grievances, sometimes exaggerated, and the grant of new privileges have increased the work of the Divisional Forest Officers to an appreciable extent.

Two villagers, who were prosecuted for having assaulted a guard in North Thana, were sentenced to undergo 3 months' rigorous imprisonment.

A forest guard in the Southern Circle who was prosecuted by a villager under section 161 of the Indian Penal Code, was acquitted by the Magistrate, the complainant being ordered to show cause why he should not be dealt with for making false allegations against the guard. The guard was given legal assistance.

In the Kolaba Division there were two cases of assault on subordinates. Conviction was obtained in one case and the other was withdrawn, the accused having apologised and agreed to pay compensation.

A forest guard in the North Thana Division, who had gone out to do plantation work in the forests, was drowned while crossing a river which was in flood. The question of granting financial help to his family is under consideration.

The number of casualties, punishments, etc., is tabulated below :—

Particulars.	Northern Circle.	Central Circle.	Southern Circle.	Total 1938–39.	Total 1937–38.
Retirements	27	20	22	69	100
Deaths	13	7	14	34*	25
Resignations	6	2	1	9	18
Degradations	29	16	2	47	48
Convictions and prosecutions.	4	..	..	4	3
Dismissals	6	9	3	18	28
Total ..	85	54	42	181	222

*Out of the 34 deaths during the year, 6 including 1 Ranger, 3 foresters and 2 guards occurred in West Thana alone.

Except in places notoriousfor bad climate where ill health is common among the subordinates the health of the staff was reasonably good.

Measures to suppress corruption.

Six-monthly reports showing cases of corruption dealt with during the period were submitted to Government in accordance with orders.

Divisional Forest Officers and their assistants again carefully scrutinised expenditure, checked measurements of work done and satisfied themselves, by close inspection of as many works as possible, that full value is being received for the money spent. All applications from the public including those from anonymous correspondents were promptly enquired into and suitable action was taken where necessary. During the year warnings were issued that adequate payments must be made for provisions and services accepted from the public by touring officers and their subordinates. No complaints of short payments or of non-payments were received.

Every facility was given to the public for easy access to touring officers, and villagers were invited to state if they had any complaints of any nature to make against forest officials.

In pursuance of this policy of taking measures to stamp out the evil of corruption in the public services Government has further decided that anti-corruption committees consisting of both officials and non-officials should be established in each district of the Province to advise and assist Government in suppressing the evil.

INSPECTIONS AND TOURS.

His Excellency the Governor of Bombay visited Yellapur and the surrounding forests in April 1938.

The Honourable the Revenue Minister, in the course of his tour in Kanara in May 1938 paid visits to the Nagzari Valley skidding operations and to the Saw Mill at Dandeli in Kanara Northern Division, and held a conference at Supa to discuss forest grievances of the villagers of Kanara. This conference was largely attended both by officials and non-officials.

The Chief Conservator toured in all the circles.

The Conservators of Forests inspected all Divisional Forest Offices in their respective circles. No serious irregularities were noticed. They also toured in their respective circles.

Civil Suits.

The following suits and appeals are pending :—

(1) Appeal filed by Mr. M. G. Mohite against the decision in his suit filed for claiming the right of ownership over the aftergrowth of teak trees in certain survey numbers in Talasari—Thana district.

(2) The suit filed by Mr. S. N. Pithawala against Government and Mr. Y. R. Divekar, Divisional Forest Officer, Kolaba, personally for damages on account of alleged instigation of labourers working in his coupe in the Nagothna Range.

(3) Of the two appeals pending at the close of last year in the Southern Circle, one was decided against Government while the other is pending retrial in the First Class Court, Karwar.

The following fresh suits were filed during the year :—

(1) Mr. M. G. Pethe of Umbergaon, Thana district, has filed a suit for claiming ownership over the aftergrowth of teak in certain survey numbers of Vase, Peta Umbergaon.

(2) Mr. P. D. Bilimoria, a dismissed Ranger, has brought a fresh civil suit, as permitted by the court, for wrongful dismissal and damages, against Government and Mr. Y. R. Divekar, Divisional Forest Officer, Kolaba, personally.

(3) A suit was filed against Government by one Mr. G. S. Hebbali of Kittur claiming Rs. 500 as damages for his alleged malicious prosecution in an offence case by the Round Officer, Golihalli (Belgaum Division) in his official capacity. The suit was dismissed on a preliminary point after the close of the year.

Land Revenue Administration.

The Divisional Forest Officer, West Nasik, continued to function as Assistant Collector and Excise Superintendent of Peint Mahal.

The excise and revenue administration of the Akrani Mahal was carried on by the Forest Department as hitherto. The revenue administration of Pal and a few other villages in East Khandesh was in the hands of the Forest Department till 1st March 1939 on which date it was re-transferred to the Revenue Department. The Raisingpur Estate continued to be managed by the Forest Department under the Court of Wards.

The revenue administration in the Dandeli, Kulgi, Virnoli and Kirwatti Forest Mahals was carried on by this Department up to the end of January 1939, when these were re-transferred to the Revenue Department.

Kumri (Shifting Cultivation).

Most of the *kumri* villages in the Belgaum Division were inspected by the Divisional Forest Officer ; the requests of some villagers for either additional land or land of better quality in exchange for their present allotments are being investigated.

Forest Village Panchayats.

The four panchayats in the Kanara Northern Division continued to work satisfactorily.

Of the 13 panchayats in the Kanara Western Division only 3 in Kumta taluka are reported to have done any work of practical utility, whereas two others in the same taluka are reported to be doing practically nothing, in spite of the Mamlatdar's urging them to stir themselves into action. The remaining panchayats managed the forests in their charge without internal friction but they have not undertaken any works of improvement.

Dangs Forest Administration.

Though the Surat Dangs were transferred to the control of the Government of India with effect from 1st July 1933, they continue to be administered by staff lent by this Department. The conditions governing the loan of services of the Bombay Government staff serving in the Dangs are still to be decided.

Relations between the Forest Department and other Departments.

These remained as cordial as ever.

CHAPTER VIII.

GENERAL.

It will be seen from the foregoing chapters that the year under report was notable in many respects. The importance and necessity of forests and tree-planting have been more fully realised inasmuch as the possibility of reclothing arid areas was considered and a start has been made to try out the "Gradoni" system. Various schemes of tree-planting in public as well as private lands are under the consideration of Government. Concessions have already been granted to private persons to plant fruit trees in open forests for their own use under certain conditions. Encouragement was given to certain existing industries utilising forest products. Possibilities of starting new industries are being investigated and a few schemes are actually under consideration. Liberal forest concessions and privileges have been granted to the people.

These activities tend to bring home to the people the realisation that the forests of the province are a valuable asset. It must however not be forgotten that forests to yield supplies in perpetuity need to be protected and conserved and their exploitation scientifically regulated. Bountiful as Nature may be there is a limit to her bounty hence the Forest Department not only prevents ruthless destruction, but regulates extraction to the limit of production in the matter of timber and fuel and follows exploitation by regeneration of exploited areas. It has never lost sight of the fact that the forests belong to the people and must be managed for their benefit.

To face the problem created by the abolition of grazing fees and the possibility of overgrazing and erosion, the rotational grazing system in force in East Khandesh is being extended to other districts.

The general depression in the timber market which prevailed during the year, combined with the non-sale of sandalwood has reduced the revenue and in spite of the fact that expenditure was kept as low as possible there was no increase in the surplus.

Business with the M. & S. M. Railway was particularly good. Two hundred and fifty tons of teak logs and 243 tons of sawn wood were supplied this year against 150 and 189 tons respectively in the previous year. The demand for metre gauge sleepers was also greater and 79,993 I class and 5,006 II class sleepers were taken against only 49,998 I class sleepers in the previous year. The Divisional Forest Officer, Northern Division, Kanara, Mr. R. J. Smith, deserves credit for the increase in trade in teak logs and sawn material with the railway. He made special efforts to encourage and meet fresh demands for these materials. Business with the railway is likely to remain satisfactory in the coming year though the demand for sleepers has been reduced from 60,000 to 30,000.

Alnavar-Dandeli Railway.

The working of the Alnavar-Dandeli Railway during the year shows a net profit of Rs. 13,255 (Rs. 56,778 receipts *minus* Rs. 43,523 expenditure) or 23·3 *per cent.* on gross receipts against Rs. 46,493 (Rs. 88,419 receipts *minus* Rs. 41,926 expenditure) or 52·6 *per cent.* of the previous year. The large difference in the net profits of the two years 1937–38 and 1938–39 is due to the fact that the last year's profit included an amount of Rs. 46,467 representing adjustment of freight on railway materials short credited to this branch line during the years 1931–32 to 1936 37.

The improvement in the earnings during the year is mainly due to railment of manganese ore by the mining concessionaires.

Hunting and Shooting.

The revenue realised from this source during the year was Rs. 8,621 against Rs. 7,238 in the previous year.

The details of animals killed in Government forests are given below :—

All India Serial No.	Animal.	Northern Circle.	Central Circle.	Southern Circle.	Total.	Average of 5 years 1933–34 to 1937–38.
1a	Tiger	..	6	24	30	32
1b	Tigress	1	8	3	12	5
2	Panther	9	12	33	54	72
3	Wild cat	..	..	..	..	1
6	Hyena	..	..	..	..	1
8	Wild dog	..	..	1	1	2
14	Sloth bear	..	3	5	8	12
15	Wild elephant	..	..	18	18	18
17	Bison	..	..	19	19	19
29	Blue bull ..	1	17	..	18*	21
30	*Bhekar* (4 horned antelope). ..	..	..	..	..	4
32	*Chinkara*	..	..	..	..	3
33	Barking deer ..	2	..	1	3	2
37	*Sambhar*	..	8	9	17	16
38	*Cheetal*	1	4	8	13	15
46	Wild pig ..	17	141	387	545*	553
	Total ..	31	199	508	738	776

*Includes 528 pig and 15 blue bull killed by the various gun clubs in the Central and Southern Circles.

Three human beings were injured by wild animals in the Dharwar-Bijapur Division. In Kanara Eastern Division a villager was mauled by a man-eating tigress, which was eventually killed by the elephant shikari of Mundgod. Special rewards of Rs. 50 to the shikari, Rs. 25 to the injured person and Rs. 25 to the beaters were paid by the Revenue Department.

Rewards amounting to Rs. 976 were granted by the Revenue Department for killing wild animals in Kanara, Belgaum and Dharwar districts.

	Rs.
Wild elephant	600
Wild dog	5
Wild pig	371
Total ..	976

His Excellency the Governor of Bombay and party had a shikar camp at Rohini in the East Khandesh division from 27th December 1938 to 3rd January 1939.

The Tansa catchment area in East Thana has been closed for hunting and shooting for a period of 5 years from 1st March 1939 as a measure of fire protection.

Increase or decrease in the number of wild animals and birds.

There was no noticeable increase or decrease in the animal or bird population except the following :—

Due to illicit shikar and poaching game is reported to have decreased in Panch Mahals and North and West Thana. Tigers are becoming scarce in East Thana. Carnivora decreased in the Kanara Northern and Eastern divisions while bison in the High Forests of the same divisions and *cheetal* and *sambhar* in the interior forests of Kanara Eastern Division appeared to have increased. Pig in the Dharwar District have decreased.

Gun clubs.

Eight new gun clubs—6 in Kanara , 1 in Dharwar and 1 in Belgaum were organised during the year. The Kanara club killed 34 pig, while Belgaum, Dharwar and Bijapur clubs killed 9, 310 and 8 respectively. It is stated by the Deputy Director of Agriculture, Southern Division, that as a result of the campaign against wild pig in the Dharwar-Bijapur Division, the necessity for watching throughout the night is fast decreasing and more land is being brought under cultivation.

Twenty-nine permits were given to the members of the 16 gun clubs in the Satara Sub-Division. 24 pig were killed. Similarly the gun clubs in East Khandesh killed 117 pig and 15 blue bull.

Measures taken to protect crops from wild animals.

An area of about 1,271 acres near Ghodasgaon village in East Khandesh has been cleared with a view to creating a "buffer area" to prevent wild animals from destroying the cultivation nearby. 19 persons have been appointed as shikaris to shoot even *cheetal* and *sambhar* within one mile of the northern bank of the Purna river. Gun-clubs are also encouraged in this division.

No restrictions are now placed on the number of *nilgai* (blue bull) to be shot by shooting license holders. In the Thana District, agriculturists who hold gun licenses for crop protection are permitted to shoot pig and *nilgai* in protected forests falling within the area to which their licenses supply.

The formation of a gun club at Kalyan for the destruction of pig has been sanctioned by Government after the close of the year.

As a result of the Supa Conference referred to in Chapter IV, all *bona fide* inhabitants of the North Kanara District who possess gun licenses may now be granted free licenses for shooting in the forest up to reasonable limits from their villages and fields.

Inforest Settlements and Dalhi (Shifting Cultivation).

No new settlement was opened during the year. The revenue derived from the assessment of land given out to the settlers in the Northern and Central Circles was Rs. 46,527 and a balance of Rs. 16,689 is still outstanding against the settlers in East and West Khandesh. One settlement in the Raver Range of the East Khandesh Division continued to be uninhabited. Revision survey of forest settlements in the Taloda Range is in progress.

Tagai amounting to Rs. 3,600 was granted to the forest settlers in East and West Khandesh. Out of the total amount due viz. Rs. 3,940 (Rs. 3,600 *plus* Rs. 340 last year's balance) Rs. 1,969 were recovered leaving a balance of Rs. 1,971. The reasons for this large outstanding amount are that the condition of the Raver settlements was bad and that no proper check could be exercised over the outstandings against the settlers of Taloda due to abolition of the North Khandesh Division.

Dalhi (Shifting Cultivation).

The area under *dalhi* cultivation in the Kolaba Division remained unchanged. A revenue of Rs. 3,478 including the last year's balance was realised.

Reserved Teak in Varkas lands in Thana.

20 *per cent.* of the sale proceeds of teak in *varkas* lands in the Thana District is paid as bonus to the occupants, and 30 per cent. to the District Local Boards for works of public utility, more especially for improvement of communications and water supply in the interior villages of the

district. The total amount of Rs. 64,472 thus paid to the Local Board since 1932-33 has remained unspent. The urgency of spending the money on useful works in the interests of the villagers has been impressed on the Local Board.

Forest Advisory Committees.

In the various meetings of the Forest Advisory Committees established in Thana, Panch Mahals, Nasik, Khandesh, Kolaba, Kanara and Dharwar districts such questions as supply of teak wood for ploughs, prompt issue of transit passes, removal of branchwood, sale of teak aftergrowth in *malki* numbers, cutting of trees for rab, destruction of wild pig, goat grazing in Peint Mahal, preservation of *anjan* (*Hardwickia binata*), reduction in the rates charged for *anjan* leaves, issue of free grazing passes, sale of grass in plantation forests, free removal of stones and thorns, storage of grass, extension of the privilege of selling firewood headloads to *Rathwas* (aboriginal tribes), authorising the Range Forest Officers to grant wood free for temporary huts to replace those damaged by fire, rates of wages to be paid for forest labour and their prompt and direct payment, disforestment of lands in Panch Mahals, etc., were discussed. The grievances put forth were, wherever possible redressed and in other cases the rules were explained.

A slight change in the constitution of these committees has occurred inasmuch as the members of the Bombay Legislative Assembly whose constituency is larger than the district and even if they are not residents of the district have now been made members of the committees, and the officers of the Agricultural Department nominated as official members to represent the rural interest on the committees have been replaced by officers of the new Rural Development Department.

The meetings of these committees are now to be held quarterly and Government have issued orders to these committees to undertake the work of supplementing Government activities and fostering public interest in the conservation and development of the forest wealth of the Province for the benefit of agriculture, forest industries and the people generally. For this purpose the committees have been permitted to coopt upto 6 additional non-official members.

Forest Grievances Redressed.

Besides the grievances removed by the grant of privileges referred to in Chapter IV various other grievances which were ventilated in the meetings of the above committees and elsewhere were removed—chief among which are the following :—

The rates of wages paid for labour employed by the Department on forest works have been brought up to the current market rates wherever they were found inadequate. The minimum rates of wages to be paid by contractors have likewise been fixed and the prescribed rates introduced, after the close of the year, in the Thana and Kolaba districts. Orders have also been issued to make prompt payments on the spot direct to the labourers. Some grazing kurans in the Nasik

district were released for free grazing wherever the grazing area open was found inadequate. Facilities for issuing transit passes were provided, wherever possible, by authorising village officers to issue passes. In the case of *mhowra* (*Bassia latifolia*) seed brought to the bazar for sale by forest villagers in the Nasik district in exercise of the privilege granted to them, the necessity of taking passes was dispensed with. The permit rates for *anjan* (*Hardwickia binata*) leaves were considerably reduced. Orders have also been issued that persons carrying headloads of fuel, met at a distance of 5 miles or more from the forest limits in the Nasik district, should not be questioned or otherwise interfered with. Sale of *dhavati* (*Woodfordia floribunda*) flowers and *safed musali* (*Chlorophytum tuberosum*) was discontinued. *Bona fide* agriculturists of Kanara have been granted the privilege of collecting *shigi* (*Acacia concinna*) pods for their domestic use.

In one of the meetings of the Forest Advisory Committee the Divisional Forest Officer, Dharwar-Bijapur was asked to write a pamphlet on "Forests and Their Utility". The then Divisional Forest Officer, Mr. M. S. Kalbag, wrote a comprehensive article which is of great value both to the public and officials engaged on educating villagers to a better appreciation of the utility of forests and of the good being done on their behalf by the Forest Department.

Exhibitions.

A *swadeshi* exhibition was held in October 1938 at Masur in the Satara district, where the possible uses of *raiwal* (junglewood) species not yet known to the people, industrial uses of softwoods, medicinal uses of various forest drugs, benefits of rotational grazing, etc., were demonstrated. The Honourable Mr. Mavlankar, Speaker of the Assembly and the Honourable Mr. Nurie, Minister for Public Works paid a visit to the Forest stall and evinced great interest.

The model timber house exhibited at the Poona and Belgaum Exhibitions of 1937 and 1938 was, as stated in Chapter IV, given free to the Lord Reay Industrial Museum, Poona, as a permanent exhibit.

To the Science exhibition held under the auspices of the Science Association of the Karnatak College, four sandalwood billets of different classes, cross sections of 4 different species, viz., teak (*Tectono grandis*), *sisum* (*Dalbergia latifolia*), *dindal* (*Anogeissus latifolia*), and *matti* (*Terminalia tomentosa*) and 12 cross and longitudinal sections of 12 principal timber species were sent as exhibits. These articles were, subsequently given to the College as permanent exhibits.

Village Improvement Schemes.

Forest officers of all ranks did a year of commendable work in connection with rural development. Instruction was given on the value of forests to the community, on the need for the protection of forests, on the privileges enjoyed in them and other allied subjects. Help and advice were given on the construction and maintenance of roads, on tree

planting, on the cleaning of wells and general sanitation, education, cottage industries, the method of storing green grass in silo pits and on other matters connected with the welfare of the people.

The Range Forest Officers concerned took an active part in the meetings held at the time when the Rural Uplift Van toured in various parts.

The Range Forest Officer, Palghar, collected the villagers of Chikhalpada and Nagwe and explained to them the necessity of tree-planting. They were advised to plant *kaju* (*Anacardium occidentale*) and some of the villagers were taken to the nursery raised by the Department at Jalsar where the technique of *kaju* planting was explained to them. The Range Forest Officer, Manor, supplied a few "*chikku*" (*Achras sapota*) grafts to the villagers of Aundhani. A nursery of *nim* (*Azadirachta indica*) has also been raised to supply seedlings for planting in village sites.

Cattle Breeding Societies.

The Gilligan Cattle Breeding Farm at Pimple in East Khandesh is flourishing. Government have now redressed the Society's grievance about insufficiency of the kuran by the grant of the remaining half of the kuran at Re. 1 per acre.

An area of 100 acres of the organised forest in the Belgaum Division given in 1936 on *hangami* (temporary) tenure to Rao Saheb V. A. Desai, for cattle breeding and poultry farming has been disforested in his favour.

The investigation, started last year, into the adequacy or otherwise of grazing areas for sheep grazing in the Southern Circle has disclosed that there is ample scope for the development of sheep farming in the forests in charge of the Revenue Department.

Provincial Fodder and Grazing Committee.

The Provincial Fodder and Grazing Committee consisting of 18 official and non-official members has been formed with the objects of classifying all lands in the Province which are best suited for management as pasture, considering all schemes of improvement of grass lands, rotational grazing experiments and devising methods of making use of spare irrigation water for raising grass and other fodder crops. The Divisional Forest Officer Working Plans, Northern and Central Circles and the Live Stock Expert, to the Government of Bombay are the Honorary Secretaries of the Committee, and the Chief Conservator of Forests and the Forest Engineer are members. The Forest Engineer is preparing a 5-year plan for the improvement of water supplies in grazing areas.

Propagation of *anjan* (*Hardwickia binata*) and rotational grazing schemes are being tried in all the circles.

Villagers are being encouraged to resort to grass cutting as an alternative to grazing.

Natural regeneration of *anjan* (*Hardwickia binata*) in Padmalaya kuran, East Khandesh Division. The area is closed to grazing during the monsoon but opened after the grass has been cut.

Grass Storage Schemes.

The stocks of grass under the local grass storage scheme in the Panch Mahals remained unchanged from the beginning to the end of the year, viz., 9¼ *lakhs* lbs.

Research Demonstration Course at Dehra Dun.

The 1938 October course at the Forest Research Institute, Dehra Dun, was attended by Messrs. W. C. de C. Walsh and G. S. Singh. Reports from these officers on the work they had seen and done were submitted to Government. The importance of these courses to all Forest Officers and in turn to the Province they serve in has become generally recognised. The present policy of sending officers from Bombay to attend these courses each year should be continued.

Propaganda.

World opinion is tending to pay more and more attention to the "Protective" aspect of forests for preventing erosion and maintaining nature's equilibrium, on which the well being of a country depends, rather than to the directly utilitarian objects of producing timber and fuel. Active propaganda is necessary in this Province to help the masses to realise the value of forests and the need for their careful protection in order to prevent erosion, preserve water supplies, provide better grazing and supply timber and fuel in perpetuity. The district forest advisory committees have been entrusted with work in this direction, as already stated earlier in this Chapter, and forest officers on their part are doing what they can to explain these subjects to the people in connection with rural development.

CHAPTER IX.

The following is the summary of the progress made in the Forest Administration of the Province during the quinquennium 1934-35 to 1938-39 :—

1. Organisation.

Superior Forest Service.

The cadre of the gazetted forest staff was 31 officers in Class I including the Indian Forest Service officers and 18 in Class II. Sind has been constituted a separate province but the gazetted forest service remained a joint one and it was decided that this arrangement should remain in force up to 1st April 1942. Though the below mentioned retrenchment was ordered by Government, definite orders fixing the cadre have not yet issued :—

(1) Abolition of the North Khandesh Division.

(2) Abolition of the working plans division for the Northern Circle, and its amalgamation with that for the Central Circle.

(3) Abolition of the post of Gurcharan Officer, Thana.

(4) Conversion of the Satara Division into a sub-division.

(5) Abolition of 4 Sub-divisional Forest Officers' posts.

Two officers of the Indian Forest Service and 6 of the Bombay Forest Service including 2 in Class I and 4 in Class II, are at present serving in Sind.

The posts of a Forestry Instructor, a Silviculturist and a Utilisation Officer have been sanctioned, the latter two after the close of the quinquennium.

As a measure of economy a temporary cut of 10 per cent. was imposed on compensatory allowances, including travelling allowance, with effect from 1st November 1937 and subsequently abolished on 1st May 1938, but the rates of permanent travelling allowance granted to gazetted officers were permanently reduced by 10 per cent. as also the rates of daily and mileage allowances. The classification of Government servants for purposes of travelling allowance was also changed.

Subordinate Forest Service.

The strength of the Executive and Protective Forest service at the beginning and close of the quinquennium was as follows :—

	No. of Rangers on pay.				No. of Foresters on pay.				No. of guards on pay.	
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
	200	175	150	80—5—125	60	50	45	30—1—40	25	15—½—20
At beginning.	11	16	24	106	22	114	..	359	444	1,989
			157				495			2,433
At close ..	9	14	20	90	20	58	84	312	394	1,736
			133				474			2,130

23 posts of Rangers were transferred to Sind and one was abolished owing to the closure of departmental fellings in the Dangs.

Of the foresters' posts 23 were transferred to Sind, 3 were newly created for specialised revenue work in the Akrani Mahal, 2 were reduced owing to the closure of the departmental fellings and sawmill operations in the Dangs and one which was retransferred from Sind and was supernumerary for sometime and absorbed in the cadre subsequently. Thus the cadre of foresters stands at present at 473.

308 posts of guards were transferred to Sind, 7 additional posts (2 orderlies, 1 for the Tulshi forests and 4 for additional beats in the Surat Sub-Division) were created. Two posts were reduced owing to the closure of departmental fellings in the Dangs.

In addition to the above changes Government have sanctioned the entertainment of 9 foresters, 3 forest surveyors and 10 forest guards on temporary establishment for the Thana divisions and ordered that the proposal to make this establishment permanent should be included in the list of new items for 1940–41.

Clerical and Inferior Service.

The strength of the clerical staff at the beginning and close of the quinquennium was as follows :—

—	Superintendents.		Head clerks.				Senior Accountants.	
	Rs. 220 —10— 300	Rs. 220 —10— 270	Rs. 150 —5— 200	Rs. 135 —5—180	Rs. 105 —5—140	Rs. 95— 5—125 E.B.135 —5—150	Rs. 115 —5/2— 150	Rs. 95— 5—125
At beginning ..	1	3	4	..	19	..	6	..
At close ..	1	3	2	2	..	19	3	2

—	Junior Accountants.	Clerks.			Total.
	Rs. 85— 5/2—100	Rs. 30— 5/2—80	Rs. 25— 5/2—55	Rs. 30— 5/2—50	
At beginning	25	152	10	47	267
At close	24	128	62	22	268

In the clerical service, those clerks who were serving in Sind remained there and the following posts in the cadre of the Bombay Province were abolished :—

1 Head clerk .. .. .. Rs. 135—5—180.
1 Junior Accountant .. .. Rs. 85—5/2—100.
2 clerks .. .. .. Rs. 25—5/2—55.

These reductions took place in the Central Circle and were due to the retrenchment referred to in the first paragraph above.

Three new posts of clerks were created—one for a new Range in the Northern Circle, 1 for the new Surat Sub-Division and 1 as an additional clerk in the Sirsi Range office in view of the amalgamation with it of the Siddapur Range in the previous quinquennium.

The scale of pay of head-clerks of Divisional offices has been revised and the designation of the head clerks of the 3 Conservators' offices and that of the Chief Conservator office has been changed to " Superintendent ".

Of the peons' posts, 2 were abolished and 1 post of a boy peon in each of the three Circle offices and 1 in the Chief Conservator's office were converted into posts of adult peons. Revised rates of pay were introduced for the inferior servants including peons. The cadre of peons is at present 97.

TERRITORIAL CHANGES.

(1) Under the constitutional changes inaugurated by the Government of India Act of 1935, Sind was separated from this Province with effect from 1st April 1936.

Owing to the retrenchment referred to in paragraph 1 under " Organisation " the following changes occurred :—

(2) The North Khandesh Division was abolished and its area distributed between the East and West Khandesh Divisions.

(3) The Rajur and Akola ranges of the Poona Division were transferred to the West Nasik Division of the Northern Circle.

(4) Mandvi Sub-Division (Surat District) which was transferred to the Central Circle on the transfer of the Dangs to the Government of India in 1933 was retransferred to the Northern Circle where the area of the Baragaon Dangs was added to it. The newly constituted independent Sub-Division under the direct control of the Conservator is called the Surat Sub-Division.

(5) The Satara Division was converted into a Sub-Division and added to the Poona Division, but subsequently made an independent Sub-Division under the direct control of the Conservator.

Some other changes took place involving redistribution of ranges, rounds and beats.

The four forest mahals of Kanara viz. Dandeli, Virnoli, Kulgi and Kirwatti, and the revenue management of Pal and other villages in East Khandesh were retransferred to the Revenue Department.

The net saving which will accrue when all the above orders of retrenchment come into effect, is as follows :—

Permanent establishment—	Rs.
Gazetted	36,600
Protective	3,818
Office	4,296
	44,714

Less—

The cost of newly created permanent establishment ..	—4,752
	39,962
Add—	
Savings on account of reduction in temporary establishment	14,172
Total ..	54,134

Note 1.—The costs of newly created posts of the Forestry Instructor, Silviculturist and Utilisation Officer and their staff has not been taken into account.

Note 2.—The revised rates of pay have been used in calculating the costs.

2. Changes in Area.

The forest area at the beginning and close of the quinquennium was :—

—	In charge of Forest Department.		In charge of Revenue Department.		Total.
	Reserved.	Protected.	Reserved.	Protected.	
	Square miles.	Square miles.	Square miles.	Square miles.	Square miles.
At beginning ..	11,660	246	1,657	622	14,185
At close ..	10,569	160	1,630	610	12,969
Difference ..	—1,091	—86	—27	—12	—1,216

The variations in the figures are due to the separation of Sind and disforestments chiefly in favour of cultivation.

3. Forest Settlement.

The above statement also gives the area finally settled in charge of the Forest Department and Revenue Department both at the beginning and close of the quinquennium.

The question of acquiring the 1st class demarcation survey numbers in the Poona and Satara districts was considered and Government had allotted a sum of Rs. 40,000 for the purpose in 1938–39, but by the end of the year the acquisition proceedings had not reached the stage at which payments could be made to the occupants.

4. Demarcation.

The total length of artificially marked boundaries in the Province at the commencement and close of the quinquennium was as follows :—

	On 1st April 1934. (Linear miles.)	On 1st April 1939. (Linear miles.)
Northern Circle	7,830	9,143
Central Circle	13,816	11,653
Southern Circle	14,222	14,328
Total	35,868	35,124

The difference is due to the separation of the Dangs and to the various territorial changes which curtailed the length of artificially marked boundaries.

5. Surveys.

Two square miles of forest in the Dharwar-Bijapur Division were surveyed by the Survey of India Department. No other survey work was done during the quinquennium.

6. Working Plans.

Preparation and revision of working plans were satisfactorily carried out during the quinquennium. The area under working plans excluding that of Sind at the beginning and close of this period was respectively 7,575 and 8,198 square miles. In all 9 revised working plans were sanctioned by Government and the following working plans were completed and received the Chief Conservator's approval :—

(1) The revised working plan for the Panch Mahals forests.

(2) Working plan for the West Khandesh (South Tapti).

The working plan for the Thana Gurcharans was completed but as it was not approved by the Commissioner, Northern Division, and the Chief Conservator, it was returned to the Conservator of Forests, Northern Circle, who resubmitted the same with proposals for the management of gurcharans. The working plan together with the Conservator's proposals has been submitted to Government for sanction. One new plan is under preparation and work in connection with the revision of 4 other plans is in progress in the Southern Circle. A working plan for the Igatpuri forests in the Northern Circle is also under revision.

7. Communications and Buildings.

The total expenditure on roads, buildings and other works at the close of the quinquennium amounted to Rs. 6,91,419 as against Rs. 12,06,899 (excluding expenditure in Sind) in the previous quinquennium.

As the financial conditions had not improved the programme of new works had to be curtailed and the expenditure was limited to urgent works only. A considerable saving on the cost of repairs was effected

by reduction in rates offered for piece work and by undertaking special repairs only in urgent cases.

Owing to the transfer of the Dangs to the Government of India there has been a considerable decrease in the expenditure under this head.

A programme of works is being now drawn up and it is hoped that liberal grants will be provided in future for providing suitable quarters for the subordinates who have been working in malarious tracts without proper housing accommodation. The question of better housing for the mill labourers at Dandeli was also taken up at the close of the quinquennium.

Plans and estimates for the following important roads were both administratively and technically sanctioned by Government but await allotment of funds :—

(1) Ozar-Saiwan road.
(2) Tembha-Parali road.
(3) Washala-Dolkhamb road.

Similarly estimates amounting to Rs. 41,277 for carrying out repairs to the Hatgad-Wani road administratively approved by Government await technical sanction.

"Toll bars" on forest roads were discontinued from 20th January 1936.

Some buildings (including Rest Houses) constructed by this Department were transferred to the Public Works Department for maintenance while some constructed by the Public Works Department were transferred to this Department for the same purpose.

8. Forest Offences.

The average annual number of forest offences reported during the period under review compares with that in the preceding five years as follows :—

—	Northern Circle.		Central Circle.		Southern Circle.		Total.		Difference.
	Quinquennium.		Quinquennium.		Quinquennium.		Quinquennium.		
	Present.	Previous.	Present.	Previous.	Present.	Previous.	Present.	Previous.	
I. Injury by fire.	795	735	601	674	305	451	1,701	1,860	—159
II. Unauthorised fellings.	5,245	3,826	5,159	4,242	1,495	1,480	11,899	9,548	2,351
III. Unauthorised grazing.	2,489	1,951	2,147	2,232	482	633	5,118	4,816	302
IV. Miscellaneous.	1,218	801	1,066	1,365	402	317	2,686	2,483	203
Total ..	9,747	7,313	8,973	8,513	2,684	2,881	21,404	18,707	2,697

There is on the whole an increase of 2,697 cases and it occurs under all heads except under " Injury to forests by fire ". The increase is due to greater vigilance on the part of the subordinates, who in spite of other important silvicultural works did not neglect the protection of forests. The decrease under fire which chiefly occurs in the Southern Circle is due to more intensive fire protection measures. The decrease under fire in the Central Circle is reported to be only apparent as the area burnt shows a tendency to increase, the last year of the quinquennium being the worst in this respect.

9. Fire Protection.

The average area under systematic fire protection and the average of failures during the two quinquennial periods are compared below :—

Average area in square miles.

Circle.	1934-35 to 1938-39.			1929-30 to 1933-34.		
	Area attempted to be protected.	Failures.	Percentage.	Area attempted to be protected.	Failures.	Percentage.
	Square miles.	Square miles.		Square miles.	Square miles.	
Northern ..	2,675	101	96·2	3,324	95	97·1
Central ..	3,844	309	91·9	3,846	362	90·6
Southern ..	1,050	32	96·95	1,622	79	95·13
Total ..	7,569	442	94·1	8,792	536	93·9

There is on the whole a decrease in the area attempted to be protected and it is due to the transfer of the Dangs to the Government of India. The decrease in the area under failures is due to more effective measures against fires.

10. Protection from Cattle.

The average areas annually open and closed to grazing during the two quinquennia were as follows :—

Average area in square miles.

—	Open to all animals.	Percentage.	Open to all animals except browsers.	Percentage.	Closed to all animals.	Percentage.
	Square miles.		Square miles.		Square miles.	
Present quinquennium.	2,656	20·4	8,673	66·6	1,677	13·0
Previous quinquennium.	3,346	22·7	9,630	65·3	1,763	12·0
Difference ..	—690	..	—957	..	—86	..

The decrease in areas is due to the separation of Sind and the transfer of the Dangs to the Government of India and to disforestments.

The normal period of closure for all areas under regeneration has been reduced from 10 to 5 years and in times of fodder scarcity additional closed areas were thrown open for grazing.

The average number of all animals admitted to graze in the forests decreased from 22,84,394 in the previous quinquennium to 21,07,394 in the period under review. The decrease is due to the following reasons :—

(1) Owing to the transfer of the Dangs the cattle of that tract have not been taken into account during the period under review.

(2) Reluctance on the part of cattle owners to take free grazing passes (since the abolition of grazing fees).

(3) Smaller number of cattle from outside the Province visited the forests of this Province.

The outstanding feature of the quinquennium is the abolition of grazing fees on all cattle except those coming from other Provinces and Indian States.

11. Yield and Outturn.

The average annual outturn of forest produce for the two quinquennia was as follows :—

(a) By Government and Purchasers.

Circle.	Major Forest Produce.				Minor Forest Produce.			
	Timber and fuel. Cft. in thousands.		Sandalwood. Value.		Bamboos. Value.		Other Produce. Value.	
	Quinquennium.		Quinquennium.		Quinquennium.		Quinquennium.	
	Present.	Previous.	Present.	Previous.	Present.	Previous.	Present.	Previous.
			Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Northern ..	11,236	9,850	..	61	11,751	53,846	1,77,833	1,81,367
Central ..	7,166	7,000	1,016	4,482	14,035	14,783	3,74,709	4,77,010
Southern ..	8,308	8,744	1,07,369	1,20,186	62,852	71,862	81,776	1,38,916
Total ..	26,710	25,594	1,08,385	1,24,729	88,638	1,40,491	6,34,318	7,97,293

The increase under timber and fuel was due to the exploitation of thinning coupes under the provisions of the Revised working plan for the Thana forests ; sale of malki coupes under the Thana malki teak working plan and a keener demand for coupes in the East and West Khandesh and Kolaba divisions.

The decrease under sandalwood is due to the depression in the sandalwood market.

Depression in the *bamboo* market coupled with the transfer of the Dangs account for the decrease under *bamboos*.

The abolition of grazing fees and poorer prices realised for certain minor products were responsible for the decrease under this head.

(*b*) *Free Grants.*

Circle.	Major Produce.		Minor Produce.			
	Timber and fuel. Cft. in thousands.		Bamboos.		Other Produce.	
	Quinquennium.		Quinquennium.		Quinquennium.	
	Present.	Previous.	Present.	Previous.	Present.	Previous.
			Rs.	Rs.	Rs.	Rs.
Northern ..	12	14	73	144	266	295
Central ..	23	38	403	1,268	13,520	3,350
Southern ..	48	58	652	677	7,343	4,490
Total ..	83	110	1,128	2,089	21,129	8,135

These grants vary according to circumstances. The majority of the grants of timber and bamboos are made for repairs to houses, temples, etc., and for building new houses in replacement of those destroyed by fire or flood.

(*c*) *By Concessionists.*

Circle.	Major Produce.		Minor Produce.			
	Timber and fuel. Cft. in thousands.		Bamboos.		Other Produce.	
	Quinquennium.		Quinquennium.		Quinquennium.	
	Present.	Previous.	Present.	Previous.	Present.	Previous.
			Rs.	Rs.	Rs.	Rs.
Northern ..	7,352	4,444	59,926	4,898	10,33,460	4,83,138
Central ..	8,923	666	132	58	4,45,864	58,993
Southern ..	8,400	3,300	12,707	45,000	3,74,708	3,04,339
Total ..	24,675	8,410	72,765	49,956	18,54,032	8,46,470

These are estimated values of material removed by the people enjoying privileges under the various privilege codes and settlements and these vary according to the needs of the people.

12. Mechanical Exploitation.

Timber was extracted successfully from the Nagzari valley, and the Kalinadi and Kaneri slopes by the Fordson skidding tractor. The areas tackled being in more difficult and steep country with outcrops of rocky beds necessitated hauling over longer distances.

The Forest Engineer, as usual, prepared a number of plans and estimates and supervised in addition to the Engineering works in progress the working of the sawmill machinery and skidding tractor and arranged for and supplied stores to both.

Two out of the three sawmills in Kanara with which the quinquennium opened were closed down for want of sufficient material.

13. Financial Results.

The average annual financial results for the two quinquennia compare as follows :—

Circle.	Revenue.		Expenditure.		Surplus.		Difference.
	Quinquennium.		Quinquennium.		Quinquennium.		
	Present.	Previous.	Present.	Previous.	Present.	Previous.	
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Northern ..	17,23,943	20,12,531	7,26,971	10,08,383	9,96,972	10,04,148	—7,176
Central ..	9,71,195	10,27,620	6,93,676	6,72,196	2,77,519	3,55,424	—77,905
Southern ..	19,30,689	24,86,869	10,93,024	16,29,826	8,37,665	8,57,043	—19,378
General—Direction and Forest—Engineering.	11,771	1,052	2,40,479	2,60,158	—2,28,708	—2,59,106	30,398
Total ..	46,37,598	55,28,072	27,54,150	35,70,563	18,83,448	19,57,509	—74,061

There has been a decrease in revenue and expenditure and surplus.

The causes for the decrease under revenue and also for a fall in the surplus in spite of reduction in expenditure are the transfer of the Dangs to the Government of India, general trade depression, abolition of grazing fees and grant of various other concessions to the people.

14. Forest Education.

In all 24 candidates were selected for appointment as Rangers during the quinquennium of whom 18 were sent to the Madras Forest College, Coimbatore, and the rest are under training at the Agricultural College, Poona. During the period of review 16 ranger students (12 of the 18 sent during the quinquennium and 4 who were selected and sent before this quinquennium) returned with Higher Standard Certificates and joined the Department; the remaining 6 also obtained Higher Standard Certificates and joined the Department after the close of the quinquennium.

Six students selected for the 1938–40 course are at present undergoing training at the Rangers' Training Class at the College of Agriculture, Poona, which was opened owing to the abolition of the Madras Forest College at Coimbatore, in 1939. Further details are given in Chapter VII.

The Foresters' Class at Mandvi in the Northern Circle continued throughout the quinquennium and 125 students in all were admitted. Of these 100 passed the final examination and were awarded certificates.

The scheme for training literate subordinates in a set course of instructions in forestry, silviculture, etc., under experienced Rangers was continued, as hitherto, in the Southern Circle. Forty-eight subordinates went through this course successfully.

15. Research and Experiments.

In the absence of a silviculturist research work was conducted by the Chief Conservator. There were 11 subjects in hand at the beginning of the period. With the separation of Sind, three subjects were passed on to the Conservator of Forests, Sind, leaving 8 subjects. Of these, one, viz. the effect of early burning on sandalwood growth and regeneration, was concluded and one was abandoned. The remaining are being continued.

Several other experiments and investigations though not forming part of the regular research programme were also undertaken by Divisional Forest Officers.

16. Administration and Control.

The office of Chief Conservator was held by the following officers :—

	From	To
Mr. C. E. L. Gilbert, C.I.E.	1st April 1934	.. 19th June 1935.
Mr. D. B. Sothers ..	20th June 1935	.. 6th December 1935.
Mr. C. E. L. Gilbert, C.I.E.	7th December 1935	.. 6th November 1936.
Mr. A. C. Hiley, C.I.E. ..	7th November 1936	.. 11th March 1938.
Mr. D. B. Sothers ..	12th March 1938	.. 17th November 1938.
Mr. A. C. Hiley, C.I.E. ..	18th November 1938	.. Onwards.

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Mr. P. E. Aitchison, C.I.E., Chief Conservator, retired from service in the year 1935.

Mr. C. E. L. Gilbert, C.I.E., Chief Conservator of Forests, retired from service on 2nd April 1937 and died soon afterwards.

Khan Bahadur S. N. J. Ratnagar, C.I.E., Officiating Conservator of Forests, retired from service on 28th September 1937.

Messrs. F. X. Saldanha and V. N. Hasabnis, Deputy Conservators of Forests, as well as Messrs. Kanetkar, Phatak and Rao Bahadur C. K. Amin, Assistant Conservators of Forests, retired during the quinquennium.

Messrs. R. R. Chaudhari, J. V. Karamchandani and Hari Singh were recruited to the Bombay Forest Service Class I and Messrs. R. D. Joshi and N. S. Kaikini were selected for the Superior Forest Service Course of 1938–40.

Messrs. S. P. Pandy, T. K. Mirchandani and S. N. Kesarcodi were appointed to officiate in Class I.

Messrs. D. R. Bharucha, S. G. Pithwa and L. V. Gonsalves and Rao Bahadur C. K. Amin were promoted to Class II.

General Remarks.

General progress.—Perusal of the financial results shows that revenue had been affected by various causes, chief among which are (1) transfer of the Dangs to the Government of India ; (2) abolition of grazing fees ; (3) a general decline in the value of sandalwood ; (4) general trade depression. The timber trade which showed signs of improvement for a short period declined again towards the close of the quinquennium. Much difficulty is experienced in disposing of the stocks of sandalwood at reasonable rates. To improve the trade in sandalwood, a conference was held at Bangalore in 1937. In this conference it was decided that the Bombay sales should be held between 15th February and 15th March every year. These dates being found unsuitable were changed to April with the concurrence of the Inspector General of Forests, the chairman of the conference, and the other provinces party to the conference. Strict economy was observed in expenditure to keep the financial results steady.

The technique of regeneration is now fairly well understood by the subordinates and exploited areas are satisfactorily regenerated both by natural and artificial methods. Exploitation is systematically regulated and efforts are being made to grow trees in blanks and sparsely wooded areas by means of the agri-silvicultural system. Afforestation of areas by contour trenching to prevent erosion, and rotational grazing experiments for improving the quality and quantity of grass and checking overgrazing and consequent denudation, engaged the attention of the Department.

Tours and visits.—His Excellency the Governor of Bombay visited Yellapur and other places where important forest operations were in progress in the month of May 1936, 1937 and 1938.

The Honourable Minister for Local Self-Government visited Dandeli in January 1935 and the Honourable Revenue Minister visited Dharwar and Kanara in April and May 1937 and in May 1938.

The Inspector General of Forests visited the Kanara and Thana forests and inspected the agri-cum-forestry plots in East Nasik during January and February 1938.

Dr. C. F. C. Beeson, Forest Entomologist, Dehra Dun, visited the North Thana Division in November 1938 for a preliminary enquiry in regard to the damage caused by "teak defoliators" and according to his recommendations an insectary has been established at Palghar from 1939.

Dr. N. L. Bor, Forest Botanist, Dehra Dun, visited Kanara in May 1939 for a botanical survey of the forests of the evergreen type in the Gersoppa valley and Malemani and Devimani ghats.

Forest Advisory Committees.—The Forest Advisory Committees established in the various districts continued to function and held several meetings. All matters which were taken up for discussion were disposed of in the best interests of the people.

Government have recently ordered that quarterly meetings of these committees should be held and that the committees should undertake the work of supplementing Government activities and fostering public interest in the conservation and development of the forest wealth of the Province for the benefit of agriculture, forest industries and the people generally. The constitution of these committees has also been enlarged.

Forest privileges, grievances and concessions.—Towards the end of the quinquennium many fresh concessions were granted to the people both of forest and non-forest villages. The abolition of grazing fees, the new privileges granted in Kanara, concessions in the matter of protecting crops from wild animals through gun clubs and concessions to private persons in the matter of planting fruit trees in open forests for their own use are very important. Grievances ventilated in the Forest Advisory Committees and elsewhere were enquired into and redressed as far as possible. Where it was not possible to do so the necessity for restriction and the rules imposing restrictions were explained.

Industries.—Material help was given towards the revival of existing cottage industries. The glass bangle and basket making industries were helped with concessions. The sandalwood carvers of Kanara are given the concession of purchasing sandalwood required by them for their trade at ¼th the market price. Certain concessions were granted to a company engaged in wood distillation. A free grant of 300 *khair* (*Acacia catechu*)

trees was given to assist the revival of the catechu industry in Kanara. Training in the technique of charcoal making was given to a small batch of people from Kanara with a view to their starting this industry in the forests near their homes. Demonstrations in charcoal making by means of a portable kiln of the Dehra Dun model called "frikiln" are being given. The possibilities of replacing imported woods for bobbins, picking arms, shuttles, etc., are being investigated. Important investigations were in progress at the end of the quinquennium in connection with the establishment of factories in Kanara for the manufacture of plywood, paper pulp, and the production of cheap power from charcoal. Certain concessions in connection with a proposed factory for paper pulp have been granted to a company after the close of the period under review.

Village Improvement schemes.—The department also took an active part in connection with the schemes for rural uplift. Several meetings of villagers were convened and forest officers and subordinates of all ranks delivered lectures on forests and their utility, privileges granted to the people and their extent, and starting cottage industries. These talks also included subjects like education, sanitation, etc. In order to create a "tree sense" among the people propaganda in favour of tree planting was carried out, seedlings where necessary being provided from nurseries raised for the purpose.

Forest exhibitions.—The department took an active part in several exhibitions during the quinquennium. Two such exhibitions worth mentioning are the "Poona Industrial Exhibition of 1937" and the "Karnatak Agricultural Show of 1938". In these the Forest Department displayed a large number of interesting and valuable exhibits. The most interesting exhibit of all was a small portable timber house designed and constructed by the Forest Engineer in which other forest exhibits were displayed. Several exhibits including the timber house were given free to the Lord Reay Industrial Museum, Poona. Contributions in the form of exhibits were also made to other institutions.

A. C. HILEY,

Chief Conservator of Forests,
Province of Bombay.

PRESS NOTE ON THE ANNUAL FOREST ADMINISTRATION REPORT FOR THE YEAR 1938-39.

Changes in area.—The forest area in charge of the Forest Department remained unchanged at 10,729 square miles, while that in charge of the Revenue Department dropped by 13 square miles to 2,240 square miles. In accordance with the policy of Government that land fit for cultivation and not required for forest or any other Government purpose should be given out for cultivation, 12 square miles were thus given out. The total forest area of the Province remained at 17 per cent. of the total land area. A programme for the acquisition of teak bearing lands within the forest demarcation limits in the Poona and Satara districts was sanctioned by Government, Rs. 40,000 being allotted to the Revenue Department for the purpose, but the acquisition proceedings in the Satara district were subsequently suspended under Government orders while those in the Poona district did not reach the stage at which payments could be made to the occupants.

Besides these, territorial changes occurred in the Central and Northern Circles due to retrenchment referred to later on. The three Khandesh divisions were redistributed into two, the Satara division was converted into a sub-division without any alteration in area and the Akola and Rajur ranges of the Central Circle were transferred to the Northern Circle.

Working Plans.—Preparation and revision of working plans for the scientific management and exploitation of forests were continued, 3 working plans being completed and data for a number of other working plans being collected during the year. This work is very important, for it provides for the utilisation of mature tree growth as fully as possible and for its replacement on scientific lines by a healthier and more valuable crop of utilisable species, to meet the needs of the local population and industries of the country.

Communications and buildings.—Since means of transport and conditions of communications play an important part in determining the price of any commodity, the department maintains about 1,100 miles of forest roads and cart-tracks and a railway line, the Alnavar-Dandeli Railway, about 19 miles in length. During the year 15 miles of cart-roads and 7 miles of bridle paths were added to the total length of roads, and a bridge on the Katur-Bomanalli road and a culvert on the Anegundi-Muttoli road were constructed. These communications also help the agriculturists in the remote villages to market their produce.

Forest protection.—The protection of forests in the interest of the country and the enforcement of the forest law and rules for the purpose inevitably bring the department into conflict with individual interests and tend to make it unpopular. The total number of offences detected during the year was 22,085 as against 21,489 in the previous year. This

shows that in spite of the fact that the subordinates were fully occupied with silvicultural and other important works, the protection of forests received equal attention.

The general protection of forests however is still far from satisfactory. It is hoped the grant of liberal concessions in the matter of grazing and the extension of other forest privileges during the last 2 years, as well as the constant informal talks by forest officials of all grades on forests, forest privileges and rules as part of rural reconstruction propaganda will secure from the people a larger measure of co-operation in the matter of protecting forests in future.

604 square miles of forest were burnt during the year as against 354 square miles in the previous year. The increase is due to several causes chief among which are intentional firing by people to obtain a good crop of grass and by poachers to facilitate illicit shikar and indifference on the part of villagers in some instances to help in putting out fires. All precautionary measures within the limits of the funds available were taken to protect the forests from fire.

Grazing.—The area open throughout the year to grazing of horned cattle was 87·6 per cent. The reduction in the period of closure from 10 to 5 years was continued in the three Thana and Panch Mahals divisions. As the normal period of closure for all areas under regeneration including teak plantations has been reduced to 5 years according to Government orders a larger area was available for grazing in Kanara. In the Bijapur district where there was scarcity of fodder, grass cutting was permitted in all closed areas, and closed coupes older than 3 years were thrown open for grazing.

The total recorded number of cattle admitted to graze was 1,925,978 as against 1,996,950 in the previous year. The decrease is perhaps only apparent as owing to the introduction of free grazing the obligation to take grazing passes was not realised by the owners of cattle. It is reported that where grazing costs little or nothing cattle are often found in large numbers and very poor in quality; whereas the best plough cattle are found where stall feeding is practised and only small grazing grounds are available for exercise.

Insect pests.—As stated in the last year's report Dr. Beeson, Forest Entomologist, Dehra Dun, visited the North Thana division in November 1938 for a preliminary enquiry into defoliator attack and according to his recommendations an insectory has been opened at Palghar.

Regeneration and afforestation.—It is one of the primary functions of the Forest Department to regulate exploitation and regenerate the area exploited so as to maintain a continuous supply of timber and fuel. During the year, 55,974 acres were regenerated by mainly natural methods and this was supplemented by raising plantations artificially. The general condition of all plantations is fairly satisfactory.

A sum of Rs. 4,000 was placed at the disposal of the Forest Department after the close of the year for afforestation of arid areas. 100 acres (30 acres in West Khandesh, 30 acres in East Nasik, 30 acres in Poona and 10 acres in Satara) were taken in hand and the experiment is being carried out on the lines of the Italian " Gradoni system ".

Plantations were also raised by the agri-cum-forestry or agri-silvicultural system and an additional area of 816 acres was brought under this form of cultivation.

Along with the works of countour-trenching and agri-cum-forestry attempts are also being made to create a sense of arboriculture among the people. Forest officers of all grades encourage villagers to take up tree-growing. A nursery was made in the Bijapur district without any cost to Government and seedlings raised in it were offered to the villagers in June and July last for planting in their holdings. Similar work was also taken up in the Dharwar district. The Chief Conservator has ordered the raising of seedlings of cashewnut and casuarina in nurseries in each of the 4 coastal ranges of W. D. Kanara for supply to those people who wish to plant them in their holdings.

At the suggestion of the Director of Agriculture, Collectors have been asked by Government to prepare schemes for planting trees in Government waste-lands, along the banks of nalas and tanks, along roadsides, in public places and also in private lands in their districts. It is proposed under this scheme to establish nurseries at various centres and in the Public Works Department bungalow compounds and similar suitable sites and to give the seedlings free to people and associations who wish to plant them. Some of the schemes are at present under the consideration of Government. The Chief Conservator and the Director of Agriculture have been requested to advise generally on these schemes.

Encouragement is also being given to private persons to plant fruit trees in open forest lands at their own expense and for their own use under certain conditions. These orders were widely published and a little more time is required before material results can be expected.

No purpose is served by raising plantations unless they are looked after and cared for until they are finally established. This work naturally devolves on forest subordinates. Mulching, weeding, cleaning and other silvicultural operations were carried out by the subordinates. Thinnings were carried out either departmentally or through contractors who purchased the standing material. In some cases the villagers themselves did this work and took the resultant material in preference to wages.

Exploitation and relief of unemployment.—The economic laws of supply and demand are applicable to the marketing of forest produce as well as to any other produce. To maintain the equilibrium between exploitation and utilisation and to avoid abnormal fluctuations in the timber market, exploitation of timber and fuel is regulated by fixing

a definite sequence of coupes in all working plans. This sequence is based not only on the age the stand will attain but also on the quantity and kind of the material which will be put on the market as a result of exploitation to meet the estimated normal demand of the people at that time. During the year, the quantity of produce removed by departmental agency was 920,000 cft. of timber, 808,000 cft. of fuel and Rs. 96,985 worth of sandalwood, while that removed through contractors was 6,611,000 cft. of timber and 19,228,000 cft. of fuel valued at Rs. 22,98,234 and Rs. 2,60,880 respectively and bamboos, grass and other produce valued at Rs. 3,53,380. This extraction of forest produce it is estimated provided employment for 8,278,661 persons who earned Rs. 30,07,182. Labour rates for departmental works have been brought up to the current market rates wherever they were found to be inadequate. Minimum wage rates have also been laid down for payment to labourers by contractors and orders for the introduction of the prescribed rates in the Thana and Kolaba districts, to start with, were issued after the close of the year.

Forest privileges.—Considerable additions were made to the Kanara privilege rules during the year as a result of the conference of Revenue and Forest Officers and the leading people of Kanara at Supa in May 1938. Chief among these are that a gun licence holder, who is a *bona fide* resident of Kanara will be granted a free licence to hunt and shoot in reserved forest up to a certain limit for the destruction of wild animals. With a view to providing larger elbowroom round inhabited and cultivated areas in the interest of public health and the preservation of crops, clearance of forest and undergrowth has been permitted under certain conditions. Orders have been issued for increasing the assignment of bettas and to consider beehives in these as belonging to the betta holders. Firing of a strip one mile wide round habitation will be allowed under the supervision of the Forest Department in all forest areas once every three years. Bare areas of minor forests may be fired by the villagers every year in April and May to promote the early growth of grass. The concession of granting tali palms at the rate of 1 stem per adult and $\frac{1}{3}$rd stem for every child under 12 has been extended to all poor people in Honavar, Bhatkal and Kumta talukas. Cane and all kinds of grass will be allowed free in future to all villagers not only for domestic use but for cottage industries also. The privilege of collecting honey from trees on strip lands has been conceded on the condition that a permit should be taken from the Mamlatdar.

Forest privileges admissible to forest villages were extended to a number of specified non-forest villages adjacent to forest areas. Free removal on permits of thorns from open forests for agricultural and domestic use only has been granted to all forest villages except those in the Poona and Satara districts as well as to certain non-forest villages in several districts of the Province.

Free grants and concessions.—324,000 cft. of timber valued at Rs. 24,237 and 25,647,000 cft. of fuel worth Rs. 4,69,065 and minor forest produce valued at Rs. 24,25,221 were removed by right and privilege

holders, while free grants of 98,000 cft. of timber valued at Rs. 35,187 and 3,000 cft. of fuel worth Rs. 81 and minor forest produce to the value of Rs. 16,666 were given in deserving cases. The grants of timber were chiefly for the construction of houses destroyed or damaged by fire, construction and repair of temples, churches and other works of public utility. Timber worth Rs. 1,000 was given free to the Lamani Training Class of Bagalkot for spinning wheels and the Model Timber House exhibited in the Poona and Belgaum shows and worth over Rs. 1,000 was given to the Lord Reay Industrial Museum, Poona, as a permanent exhibit.

Forest Industries.—Substantial help was given to various existing industries such as match, distillation of wood, bangle, basket-making, etc. A small batch of men from the Kanara district was trained at Government expense in the art of charcoal making and these people are to take up this trade permanently and instruct others who are willing to do so. Demonstrations in charcoal making by the use of a portable kiln designed by the Forest Research Institute were also given. 300 *khair* trees were granted free to Mr. S. K. Kallapur of Honavar for the manufacture of catechu. Sandalwood carvers of Kanara are now given sandalwood for their business at ¼th the market rate. During the years 1938 and 1939 Government did their best to encourage the subsidiary industries and considered the possibilities of starting new industries chief among which are :—

(1) *Paper pulp.*—Two projects for the utilisation of bamboos from the Kalinadi and Gangavali valleys were submitted to Government by two different companies. Certain concessions have been promised by Government to these companies.

(2) *Plywood Industry.*—The services of Dr. Bor, Forest Botanist, Dehra Dun, were utilised in April last to investigate the possibilities of a sustained supply of timber for plywood manufacture from the evergreen forests of the Gersoppa valley. Various specimens have been sent to Dehra Dun for tests.

(3) *Charcoal gas.*—The possibility of developing the use of producer gas from charcoal mainly for traction units is being examined. The results of experiments carried out by the Forest Engineer with the Fordson tractor were encouraging and Government have sanctioned the purchase of a producer gas lorry.

Investigations to find out suitable substitutes for foreign woods used in special industries for picking arms, bobbins, shuttles, reeling machines, slate frames, shoe heels and lasts and umbrella handles are being carried out by the departments.

Forest Engineering Branch.—The Forest Engineering Branch was as usual engaged in preparing designs and estimates for forest engineering works, supervising and constructing the more important works and

controlling mechanical skidding and the working of the saw mill at Dandeli. The output of the latter was 159,177 cft. and the net profit Rs. 2,35,873.

Financial results.—The financial results of the year show a gross revenue of Rs. 40·60 lakhs and a surplus of Rs. 13·73 lakhs after deducting the cost of establishment and all works of conservation, maintenance and regeneration. The revenue decreased by 2·5 lakhs of rupees and the surplus by 2·1 lakhs of rupees due chiefly to the general depression in the timber market and the unavoidable postponement of the sandalwood sales. At the sandalwood conference at Bangalore in 1937, it was agreed that the Bombay sandalwood sales should be held annually between 15th February and 15th March. These dates were found unsuitable and steps were taken to get them altered so as to hold the sales in April each year.

Research.—Research and experiments in silviculture were continued as usual under the control of the Chief Conservator.

Retrenchment.—As a measure of retrenchment, Government ordered the following redistribution of charges and reduction of posts during the year :—

(1) the three Khandesh divisions were redistributed into two, the North Khandesh Division being abolished and its area divided between the East and West Khandesh divisions ;

(2) the Satara division was converted into a sub-division and added to Poona Division, but owing to administrative difficulties it was subsequently converted into an independent sub-division ;

(3) the Working Plans division of the Northern Circle was amalgamated with the Working Plans Division of the Central Circle, the combined division being styled Working Plans Division, Northern and Central Circles ;

(4) the post of Gurcharan Officer, Thana was abolished ; and

(5) four sub-divisional posts have to be abolished as vacancies occur.

The long felt need of a silviculturist and an utilisation officer was removed by the sanction conveyed after the close of the year to the creation of these posts.

Forestry Education.—Since the Coimbatore Forest College was finally closed down in 1939, arrangements had to be made for the training of the Bombay students selected for 1938-40 course. A Rangers' Training Class was opened at the College of Agriculture with Mr. R. R. Chaudhari as the Forestry Instructor. The forestry subjects including silviculture, forest management, forest engineering, etc., are taught by the Forestry

Instructor, while lectures on such subjects as botany, physical science, drawing and surveying, etc., are given by the college staff. This arrangement is not more expensive to Government than either the Coimbatore or Dehra Dun training, while to the students themselves it is decidedly more economical and convenient.

Land Revenue and Excise Administration of predominantly forest areas.—The land revenue and excise administration of the Peint taluka in the Nasik district and of the Akrani mahal in the West Khandesh district as well as the revenue administration of certain villages in the East Khandesh and Kanara districts continued in the hands of this department. The villages in East Khandesh and Kanara were transferred to the Revenue Department from 1st March and 1st February 1939, respectively.

Rural development.—Forest officers of all ranks took an active part in the village improvement schemes. The Forest Advisory Committees, wherever they have been established, held meetings and the grievances ventilated in these meetings as well as elsewhere were as far as possible redressed and where it was not possible to do so, the rules on the subject were explained.

It will thus be seen from the foregoing that the year under report was notable in many respects. Attempts were made to impress upon the people the importance and necessity of forests and tree-planting and experiments started for reclothing arid areas under the "Gradoni system". Various schemes of tree-planting in public as well as private lands are under the consideration of Government. Concessions have already been granted to private persons for planting trees for their own use under certain conditions. Encouragement was given to certain existing industries. Possibilities of starting new industries are being investigated and a few schemes are actually under consideration. Liberal forest concessions and privileges have been granted to the people. Every possible effort was made to redress the grievances of the people.

These activities will tend to bring home to the people the vital part played by forests in national economy. It must, however, not be forgotten that forests to yield supplies in perpetuity need to be protected and conserved and their exploitation scientifically regulated. Bountiful as Nature may be, there is a limit to her bounty; hence the Forest Department not only prevents ruthless destruction, but regulates extraction to the limit of production in the matter of timber and fuel and follows exploitation by regeneration of exploited areas. It has never lost sight of the fact that the forests belong to the people and must be managed for their benefit.

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